

PERSONALITY AND PAIN RESPONSE: A COMPONENTIAL ANALYSIS

By

JOAN CANAL SCHOEFFEL

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Joan Canal Schoeffel

In Memoriam

Alfred Canal
1934-1967

and

Catherine White Schoeffel
1929-1982

Non Omnis Moriar
Horace

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Joan Canal Schoeffel

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The management of postoperative pain is related to a decreased incidence of postoperative complications and length of hospital stay. Pain theory claims that part of the response to pain is mediated by motivational-affective and cognitive-evaluative factors such as culture, personality, anxiety, attention, and suggestion.

I investigated the role of personality in pain response, in particular, Jungian psychological types and the coping styles described by Millon. Participants took the Myers-Briggs Type Indicator, Millon Behavioral Health Inventory, Wallston Health Locus of Control Scale, and completed a symptom checklist before surgery. Postoperatively, subjects completed the McGill Pain Questionnaire. Thirty-two of the volunteers had gastric bypass procedures, 12 were fresh postoperative hand surgical patients, and 11 were hand surgery patients of more than 1-week

duration. The ANOVA revealed significant differences between the three groups in pain response.

Findings for personality type indicated there are few significant differences in reports of pain response, and differences were not consistent for all groups. The findings on coping styles and pain response were also not consistent for all groups.

In the gastric bypass group, feeling types and subjects with inhibited and sensitive coping styles reported significantly more pain.

In the hand surgery group subjects with inhibited and sensitive coping styles had significantly higher scores on several of the pain scales.

In the hand rehabilitation group extraverted subjects were significantly more external on the Health Locus of Control Scale, and previous studies indicate that this is related to pain response. Subjects with introversive, respectful, and sensitive coping styles had significantly higher scores on several of the pain scales.

Implications for health professional education and future research are discussed.

CHAPTER 1 INTRODUCTION

The purpose of the study was to examine the relationship between pain response and personality.

Every adult and most children have suffered from pain at one time or another. Pain theory states that individual pain perception is associated with "interrelated biological, psychological, and social factors" (Monks & Taenzer, 1983, p. 233). This may include motivational-affective and cognitive-evaluative dimensions described by Melzack and Dennis (1978). Pain is partially a learned response to noxious stimuli. The learning is influenced by personality, social, environmental, and cultural factors. With this in mind, I attempted to examine the phenomenon of acute pain from the perspective of personality. This chapter includes the purpose of the study and some brief introductory remarks outlining the differences between chronic and acute pain. Along with the statement of the problem and significance of the study, the chapter includes a brief background and other information on personality type and coping styles. It also includes a table of definitions and a section on the limitations of the study.

Because of the complexity of pain, scientists from many disciplines study it. A recent Time (1984) cover story on pain stated that "pain research is an orphan field that neither anesthesiology, neurology, nor psychiatry can entirely claim as its own" (p. 59). Pain research and

management is a new field of study. Over the last decade many large medical centers and some private institutions both nationally and internationally have opened pain clinics or centers strictly for its study. These centers and clinics generally focus on the chronic pain patient. This study is about acute pain, and a good place to begin is by reviewing the differences between chronic and acute pain. Identifying the differences helps to explain why the two types of pain are not studied together.

Sternbach's (1978) review of the experimental and clinical literature reveals a significant difference between acute and chronic pain. Acute pain is described as "pain of recent onset or of short duration" (p. 243). An example of this would be surgical pain. Chronic pain is "pain of at least several months duration" (p. 243). An example of this would be pain associated with chronic arthritis or recurrent migraine headaches.

Besides temporality, the differences between these two types of pain are both physiological and psychological. Table 1-1 lists the basic differences in response to the two types of pain. Acute pain is generally accompanied by an increase in the release of epinephrine, causing many physiological symptoms. Investigators have found that medical or psychological intervention to reduce anxiety associated with acute pain will diminish the pain response. Likewise, treatment of the depression associated with chronic pain "frequently results in a significant reduction of pain," and "the reduction or abolition of pain reverses the neurotic depression caused by the pain" (Sternbach, 1978, p. 243).

Table 1-1

Comparison of Responses to Acute and Chronic Pain

<u>Physiologic Response</u>		<u>Psychological Response</u>
Fight or Flight		Anxiety
Acute	Includes:	Includes:
	increase heart rate	feeling tense, irritable, nervous
	increase blood pressure	insecure, dread, malaise, jumpy,
	increase pupil size	excited, talkative, apprehensive
Pain	increase muscle tension	
	decrease gut motility	
	decrease superficial capillary flow	
<u>Autonomic Responses</u>		<u>Depression</u>
Chronic	Includes:	Includes:
	sleep disturbances	insomnia, low energy, chronic
	appetite changes	fatigue, guilt, feeling of
	decreased libido	inadequacy, productivity
Pain	irritability	decrease,
	general withdrawal with	decreased attention, social
	weakened relationships	withdrawal, pessimistic
	increased somatic	attitude, less talkative,
	preoccupation	tearfulness

(Adapted from Sternbach, 1978)

In this study I examined the relationship between personality type theory as described by Jung (1971), coping styles as described by Millon (1973), and pain expression as described by Melzak (1975). Type theory includes an explanation of how one perceives and judges the world. Coping styles include degrees of cooperativeness, sociability, confidence, inhibitions, and sensitivity. Pain expression is the magnitude of perceived pain. All of these variables are explained in depth in the Background of the Study.

Statement of the Problem

Although scientists agree that personality influences pain, investigations of this influence generally focus on mood, neuroticism, and anxiety (Lim, Edes, Kranz, Mendelsohn, Selwood, & Scott, 1983; Merskey, 1978). The literature contains no studies on the relationship between personality type, coping style, and acute pain.

Health care personnel, although aware of individual differences among patients, generally are not taught to take these differences into consideration when planning care. Clinicians and investigators who design programs for postoperative pain management generally do not consider personality, type, or coping style as a significant factor when individualizing a program.

Significance of the Study

Because a "number of postoperative dysfunctions are related directly or indirectly to postoperative pain" (Benedetti, Bonica, & Bellucci, 1984, p. 381), effective treatment of pain is an important issue in the recovery of the patient and the prevention of these dysfunctions. The treatment of postoperative pain includes appropriate analgesia and psychological intervention. "The incidence, severity, and duration of pain and suffering during the postoperative period can be decreased by proper preoperative and postoperative psychologic care" (p. 388).

In recent years researchers have given much attention to pain response. However, certain questions have not been answered. One question relates to the role of personality type and coping style in pain response (Table 1-2). Research indicates that certain types of

Table 1-2

Definitions

Term	Definition
1. Personality type	"A type is a characteristic specimen of a general attitude occurring in many individual forms. From a greater number of existing or possible attitudes I have singled out four that are primarily oriented by the four basic psychological functions: thinking, feeling, sensation, intuition. When any of these attitudes is habitual, thus setting a definite stamp on the character of an individual, I speak of a psychological type" (Jung, 1971, p. 482).
2. Coping styles	"Complex forms of instrumental behaviors, that is, ways of achieving positive reinforcements and avoiding negative reinforcements" (Millon, 1981, p. 89).
3. Sensory words	"Words that describe the sensory qualities of the experience in terms of temporal, spatial pressure, thermal and other properties" (Melzak, 1975, p. 278).
4. Affective words	"Words that describe the affective qualities, in terms of tension, fear and autonomic properties that are part of the pain experience" (Melzak, 1975, p. 278).
5. Evaluative words	"Words that describe the subjective overall intensity of the total pain experience, for example, annoying, troublesome, miserable, intense, and unbearable" (Melzak, 1975, p. 278-81).
6. Locus of control	"The perceived influence that one has on the attainment of reinforcement" (p. 439). "Internal control refers to the individual's belief that he or she can significantly determine whether or not a goal will be reached, while external control refers to the belief that fate, or external agents rather than personal factors, are the most important determinants of goal attainment" (Feshback & Weiner, 1982, p. 144).
7. Organic pain	Pain associated with organic disease or surgery.
8. Functional pain	Pain without associated evidence of organic disease.

pain intervention programs are more effective than others. For example, Anderson and Masur (1983) suggested that the most effective type of psychological preparation "appears to be a combination of sensory and procedural data" given to a patient prior to surgery (p. 10). They add that although these approaches have been effective in terms of selective outcome measures, "the underlying mechanism has remained elusive" (Anderson & Masur, 1983, p. 10). Thus, in this study I analyzed two components of personality: type and coping style as they relate to pain response.

By examining the relationship between pain response and personality, I suggest additional components to the puzzle of pain. Findings may lead to revision of the education of health care personnel and of pain intervention programs. Today, government policy is aimed at decreasing health care expense. I designed this study to generate knowledge that could influence the length of hospital stay. Thus, this study has economic as well as social ramifications.

Background of the Study

Pain is a subjective experience. This subjectivity has limited attempts to quantify and study pain. Some investigators examine laboratory-induced pain and others study either chronic or acute pain. The question arises as to the role cognitive factors play in pain and pain expression. Does personality mediate pain expression? If so, how might this information be useful in planning an appropriate intervention program?

Furthermore, since the study of the pain experience involves human subjects, componential analysis is the most common approach for investigators of the phenomenon. Some of the more common components are cultural, social, physiological, medical, learning processes, behavioral manifestations, clinical aspects, psychodynamic aspects, perception, and personality (Sternbach, 1978). Studies involving pain expression generally come under clinical, psychodynamic, perceptual, or personality components. Studies of chronic or acute pain involve either observation by the investigator or self-report. Both methods have advantages and problems. Research involving behavioral observations has led to the adoption of a behavioral perspective in the management of pain patients (Fordyce, 1978). Some psychologists believe that this behavioral emphasis has "retarded the discovery of other important conceptual approaches in pain management" (Parker, Doerfler, Tatten, & Hewett, 1983, p. 208).

The concept that the etiology of pain can be entirely physical or entirely psychogenic is only slightly more than 100 years old (Mereskey, 1980). This insight occurred after advances in anatomy and physiology led to the theory that pain was due to stimulation of specific pain pathways. Prior to this enlightenment, health care personnel treated pain more or less as an emotional response or a response to something that occurred outside of the body. Mereskey (1980) reviewed the history of the concept of pain from antiquity, when society recognized some relationship between pain and physical experience, to Freud, who developed the idea that bodily symptoms could result from unconscious thought processes. Somewhere in this expanse of

history is the primitive concept that the origin of pain is purely external. Mereskey (1980) suggested that as far as we have come in the study of pain, "the ideas of Jeremiah and Aristotle still find a place in thought after more than two millennia" (p. 6). Aristotle declared pain to be one of the "passions of the soul" and separated it from the five senses, giving it an identity of its own. Jeremiah gave it an exogenous origin declaring "from above He sent fire into my bones" (Lamentations 1, 12-13). Jeremiah would be considered to have believed in an external locus of control, that is attributing pain to forces outside the individual, such as fate, bad luck, or evil eye.

Personality

Jungian type theory postulates that "much seemingly chance variation in human behavior is not due to chance; it is in fact the logical result of a few basic observable differences in mental functioning" (Myers, 1980, p. 4). Jung asserted that these differences were not gender specific or related to social class nor were they "mere idiosyncrasies of character peculiar to individuals" (cited in Campbell, 1976, p. 179). He believed that the apparent random distribution of type was evidence that "it cannot be a matter of conscious intention, but must be due to some unconscious instinctive cause" (cited in Campbell, 1976, p. 180). Jung's types are meant to be descriptive of normal behavior essentially free of psychopathology. Differences lie in how people perceive the world and how they judge what they perceive. The way people use these functions, perception (P) and judgment (J), is related to their

preference for the outer world (extraversion) (E) or the inner world (introversion) (I).

Perception can be either sensing (S) or intuitive (N). Sensing individuals are described as very aware of their immediate environment. They are the first to notice when the seasons change or when the birds migrate. Intuitives, on the other hand, are less concerned with the here and now and more aware of the potential of a given situation. People familiar with Jung's theory and their own type claim that sensing types, because of their awareness of the immediate environment, should be more aware of physical changes in their bodies than intuitive types are.

Persons who are oriented to life primarily through sensing perception typically develop acute powers of observation, a memory for facts and detail, a capacity for realism and an enjoyment of the pleasures of the immediate moment. Persons who are oriented to life primarily through intuitive perception typically are attuned to future possibilities, often creative ones, and develop the ability to see patterns at theoretical or abstract levels and to enjoy the play of imagination. (McCaulley, 1981, p. 299)

Judgment can be either thinking (T) or feeling (F). Thinking types tend to be analytical and logical. They prefer to react to a situation objectively relying on factual evidence. McCaulley (1981) described thinking as

the function that links ideas together by means of concepts, making logical connections. Persons who are oriented to life primarily through thinking typically develop strong powers of analysis, objectivity in weighing events with regard to logical outcomes, a time perspective concerned with connections from past through present to future, and a tough-minded skepticism. (p. 300)

Because of this objectivity, thinking types would be expected to use more objective sensory type language regarding issues of their personal

health. Feeling types prefer to judge by personal values rather than by impersonal logic. Feeling is described as "the function that arranges the contents of consciousness according to their value. Persons who are oriented to life primarily through feeling typically develop sensitivity to questions of what matters most to people, a need for affiliation, a capacity for warmth, a desire for harmony and a time orientation emphasizing the preservation of the values of the past" (McCaulley, 1981, p. 300). Feeling types, because they use emotion, might be expected to use more affective or evaluative language when talking about their health.

While sensing, intuition, thinking, and feeling are orienting functions that reflect perception and judgment, extraversion and introversion are considered attitudes.

In the extroverted attitude, attention seems to flow out--to be drawn out--to the objects and people of the environment. There is a desire to act on the environment, to affirm its importance, to increase its effect. In the introverted attitude, energy seems to flow from the object back to the subject, who conserves this energy by consolidating it within his own position. (McCaulley, 1981, p. 297)

Some studies have been done on the extraversion-introversion orientation and pain behavior, and these will be examined in the literature review. In this study I examined this orientation in terms of response to pain as opposed to pain behavior.

So far I have described two attitude types (extroverts and introverts) and four function types (sensing/intuition and thinking/feeling). The test used to measure these types, in this study the MBTI, also includes a fourth preference: judgment/perception. This dimension was not described by Jung but added by Myers (1980) who claimed that Jung

implied the existence of this dimension. Basically it describes whether a person prefers to use judgment or perception in dealings with the world. According to Myers, "This preference makes the difference between the judging people who order their lives and the perceptive people who just live them" (Myers, 1980, p. 9). McCaulley (1981) summarized the four preferences in Advances in Psychological Assessment, reproduced with the author's permission in Table 1-3.

According to Jung's theory, one of the four functions (sensing, intuition, thinking, or feeling) becomes the dominant function and provides direction and stability to the personality. If the dominant function is a perceptive function (sensing or intuition), it will be balanced by development of one of the judgment functions (thinking or feeling). This second function is known as the auxiliary function. Further balance in the personality is provided by the theoretical assumption that for extraverts, the dominant function will be used mainly in interactions with the outside world, while the auxiliary is used mainly in the inner world of concepts and ideas. For introverts, on the other hand, the dominant function is used mainly in the inner world of concepts and ideas while the auxiliary is used with the outside world. Each of the Jungian types has its own special relationships postulated between the developed functions and the extraverted and introverted attitudes (Myers & McCaulley, 1985).

Coping Styles

Coping styles, measured by the Millon Behavioral Health Inventory, were derived from Millon's biosocial theory of personality development.

Table 1-3

The Four Preferences Scored to Generate Types

Does the person's interest flow mainly to			
The outer world of actions objects, and persons?		The inner world of concepts and ideas?	
E	Extraversion	Introversion	I
Does the person prefer to Perceive			
The immediate, real, practical facts of experience and life?		The possibilities, relationships, and meanings of experiences?	
S	Sensing	Intuition	N
Does the person prefer to make Judgments or decisions			
Objectively, impersonally, considering causes of events and where decisions may lead?		Subjectively and personally, weighing values of choices and how they matter to others?	
T	Thinking	Feeling	F
Does the person prefer mostly to live			
In a decisive, planned and orderly way, aiming to regulate and control events?		In a spontaneous, flexible way aiming to understand life and adapt to it?	
J	Judgment	Perception	P

Note. Adapted from McCaulley, M. H. (1981), Jung's theory of psychological type and the Myers-Briggs Type Indicator. In P. McReynolds (Ed.), Advances in Psychological Assessment (p. 298). San Francisco, CA: Jossey Bass. Used with permission.

According to Millon (1981), personality development is linked to "periods of neurological maturation rather than psychosexual stages or cognitive functions" (p. 79). He referred to these periods as "neuropsychological stages." They are stage 1, sensory-attachment, which comprises the first year of life; stage 2, sensorimotor-autonomy, generally occurring over the next 3 years of the child's life; and stage 3, intracortical-initiative, what he called the peak period of neurological maturation for certain psychological functions (p. 89). This stage occurs between the ages of 4 and 18. It is within this last stage that Millon believes coping strategies are learned. Millon developed a theoretical model of the essential strategies that guide coping behavior in terms of "what reinforcement the individual is seeking, where the individual is looking to find them, and how the individual performs in order to obtain them" (p. 91).

The theoretical model begins with two basic dimensions. The first dimension has to do with an individual's possessive source of positive or negative reinforcement and within this dimension there are four distinct styles:

1. Detached. This group represents the people who experience few rewards or satisfaction.
2. Dependent. People who measure their satisfaction or discomforts on how others react to them.
3. Independent. People whose satisfaction is in terms of their own values and desires with little reference to the wishes of others.

4. Ambivalent. People in conflict over whether to be guided by what others say or their own wishes.

The second dimension reflects the basic pattern of coping behavior, with two distinct styles:

1. Active. People who arrange and manipulate their lives to achieve satisfaction and avoid discomfort.
2. Passive. People who are restrained, resigned, or content to allow events to take their own course (Millon, 1984).

Millon combined the first dimension (sources of reinforcement) with the second dimension (coping behavior) and came out with a four by two matrix from which he derived his basic coping styles. Since he is a psychopathologist, the original coping styles consisted of eight mildly pathologic styles and three very severe styles. These styles are measured by an instrument designed for that purpose and only suitable for use in patients with suspected psychopathology. The coping styles assessed in this study are normal variations based on the same model of personality and measured by an instrument designed specifically for a medical, not a psychiatric population (Meagher, 1986). These styles consist of introversive, inhibited, cooperative, sociable, confident, forceful, respectful, and sensitive (Millon, Green, & Meager, 1982, p. 2). A brief description of these styles can be found in Chapter 3 and a more detailed description in Appendix A.

Pain Expression

Pain expression is a dimension of the magnitude of perceived pain. This includes the quality and intensity of the experience. Melzak

(1975) believes that quality is unique and should not be limited to a sensory description. He suggested also examining affective and evaluative qualities of the experience. Sensory qualities include temporal, spatial, pressure, and thermal aspects. Affective qualities include tension, fear, and autonomic properties. Evaluative qualities involve the overall intensity of the experience, from annoying to unbearable (Melzak, 1975).

Other methods of defining pain expression involve observation by the investigator of overt behaviors such as restlessness, grimacing, groaning, and medication usage. Behaviors such as blood pressure, pulse, EMG readings, and galvanic skin response are also used to define pain expression.

The instrument I used to measure pain expression was the McGill Pain Index. This self-report technique developed by Melzak (1975) measures the sensory, affective, and evaluative qualities of the pain experience.

Hypotheses and Research Questions

I hypothesized that personality type is associated with pain expression, and that coping styles are associated with responses on the McGill Pain Questionnaire.

To test these hypotheses, I addressed the following research questions: Is personality type associated with a particular type of pain response? That is, is type associated with sensory, affective, or evaluative responses? Additionally, is coping style associated with pain response? If so, in what direction?

Limitations of the Study

Pain has many components, and to include all of these components in this study even if they were fully understood, would be impossible. Culture, for example, is not accounted for, and yet Zborowski (1969) makes a good case for the role it plays in pain expression.

In addition, the sample of three groups of surgical patients is not truly random. The first group was composed of patients who have had a gastric bypass procedure for morbid obesity. All morbidly obese patients did not have an opportunity to participate because selection for surgery is not entirely up to the patient. Because of the risk, involved patients are selected for this procedure after evaluation of many other criteria, such as age, general physical and mental health, and economic factors. Within the group that was selected, every patient scheduled for surgery during a 5-month period did have an equal opportunity to participate but not all chose to do so.

The second and third groups comprised hand surgery patients, and this selection was also not random. Patients were volunteers who presented with hand problems over a 3-month period.

Another limit of the study is in the sample size. Because of the small number of participants, it is not possible to discuss type in terms of combinations of all four functions. In this case the individual functions are discussed. Thus, our understanding misses something since "the whole is greater than the sum of the parts."

CHAPTER 2 REVIEW OF THE LITERATURE

Historical Perspective on Pain

Ever since human beings have been recording the events of their lives, they have been writing about pain. Efforts to understand and control pain have brought western civilization from the healer and shaman to the physician with a team of health professionals. The Eastern practice of acupuncture for the prevention and treatment of pain is considered to be more than 5,000 years old. A 20th century observer visiting a museum or a ruin in North, Central, or South America can see evidence in artifacts and hieroglyphics of pain intervention by Indian medicine men.

Procacci and Maresca (1984), in their review of the pain concept in western civilization, asserted that "prehistoric people had no difficulty in understanding pain associated with injury, but they were mystified by pain caused by disease" (p. 1), so they associated the latter with magic and demons. These beliefs persist today in subliterate societies in third world countries. Indeed, the education of health professionals in the United States consists of at least one lecture on the superstitious beliefs of such cultures within our society. Fear of the "mal oho" among Latin Americans and "voodoo death" among Haitians still exists in a society that can send men to the moon. Another myth, that somehow pain is associated with demons and sin, also

comes from the ancient Assyrio-Babylonian and Hebrew civilizations. This concept somehow became part of the Christian ethic and is "the fundamental significance of the word 'pain' in English, derived from the Latin word poena meaning punishment" (Procacci & Maresca, 1984, p. 4).

The ancient Greeks believed that pain was associated with pleasure (Maresky, 1980; Procacci & Maresca, 1984) since the removal of pain was pleasurable and also that pain was "an emotional experience rather than merely a disturbance located in the body" (Maresky, 1980). This view apparently prevailed until the 11th century. Aristotle believed that the heart was the location of the soul and also the center of sensory processes. Not until the fourth century B. C. did successors of Aristotle provide anatomic evidence that the brain was part of the nervous system.

The Roman writers considered pain "in relation to the phenomenon of inflammation." Galen brought Greek and Egyptian teaching to Rome in the second century. His own work included a description of the nervous system and the concept that "the center of sensibility was the brain" (Procacci & Maresca, 1984 p. 4). Nevertheless, Aristotle's idea that pain was a "passion of the soul" that was felt in the heart remained until the 19th century.

During the Renaissance, the ideas of Aristotle were scrutinized but none the less they survived. The opposing theories, such as those of Descartes, did not make their way into the medical textbooks of the time. In the first half of the 19th century, German scientists demonstrated that the brain was involved in sensory and motor activity. By the end of the 19th century the Aristotelian view was no longer popular,

and the long journey toward a scientific understanding of the physiological nature of pain had begun.

Modern approaches to the nature of the pain experience come from many disciplines. The gate theory proposed by Melzack and Dennis (1978) is perhaps the best known and most popular of the physiological approaches. Gate control theorists only attempt to explain the activity of the nervous system when pain is experienced. Gate control theory proposes that "neural mechanisms in the dorsal horns of the spinal cord act like a gate that can increase or decrease the flow of nerve impulses from peripheral fibers to the spinal cord cells that project to the brain" (Melzak & Dennis, 1978, p. 2). This adjustment of the nerve impulses takes place before injury or somatic input invokes pain perception and response. According to the theory, large fiber inputs close the gate, and small fiber inputs open the gate. The mechanism for the inhibition and facilitation is unknown. Since it is now known that all dorsal horn cells are under the control of fibers that descend from the brain, it is believed that descending influences such as motivational drive and cognitive evaluative activities will also affect the gate. When the output of the spinal cord transmission exceeds a critical level, the individual experiences pain. "The complex sequences of behavior that characterize pain are determined by sensory, motivational, and cognitive processes that act on motor mechanisms" (p. 12). Motor mechanisms are "all of the brain areas that contribute to overt behavioral response patterns" (Melzak & Dennis, 1978, p. 12).

The affective influence espoused by the ancients seems consistent with current research of scientists such as Melzack and Dennis.

Affective influences can include cultural and social influences, cognitive influences including attention and past experience, and personality influences. The focus of the remainder of the review will be on (a) previous studies of pain and personality; (b) personality components such as type, coping styles, and locus of control; and (c) estimates of pain through the McGill Pain Questionnaire.

Studies on Pain and Personality

This review will cover components of personality and pain behavior in medical, surgical, and obstetrical patients. No studies were found which specifically discussed personality type based on Jung's theory and pain response or pain behavior.

Most studies of surgical patients in acute pain have centered on medication usage and anxiety. Although anxiety is certainly a factor, to improve and expand approaches to pain management, investigators must examine other aspects of personality. Pilowsky (1978) wrote, "It would be patently foolish to hope to understand so complex a phenomenon as pain without taking into account its interaction with the total personality" (p. 203).

The surgical experience provides an ideal setting for the study of individual variables such as personality type, coping style, and the magnitude of perceived pain. A patient's anxiety, level of discomfort, and concern for well being is considerably more realistic than in experimentally induced pain research. "Surgery is a high stress situation which evokes intense emotional reactions, involves

considerable physical danger, and is quite painful" (Scott, Clum, & Peoples, 1983, p. 283).

Most researchers agree that there is a considerable difference between experimentally induced pain and clinical pain, and because of these differences, experimentally induced pain studies have come under some criticism. Wolff (1978) summed this up as follows:

The major criticisms of experimental pain have been that (a) there is no significant psychological involvement and implication for the subject so that there is no real "suffering," which is in sharp contrast to clinical pain; (b) the duration of experimental pain--seconds, minutes, perhaps a couple of hours--is much shorter than clinical pain, which may last many years; and (c) the intensity of experimental pain is usually much less than the severity of clinical pain. (p. 149)

In addition to the above criticisms there is the matter of perceived control of the noxious stimuli. Ethics and the law demand that experimental pain subjects be allowed to withdraw at anytime. Clinical pain does not offer that option without the risk and side effects that come with the use of analgesics.

In his examination of the differential pain tolerance of extraverts and introverts during childbirth, Eysenck (1961) found that "the more extraverted the patient, the more unbearable did the labor situation seem to her in retrospect" (p. 422). He attributed the differences in reported pain to the fact that extraverts are "the types, by and large, who are given to voicing their grievances, while introverts . . . are those who tend to play down the experience as not too painful" (p. 423). He believes that the intrinsic experience of childbirth is the same for extraverts and introverts and that the response of extraverts is "behaviorally exaggerated." He also examined the effect of neuroticism

on behavior and attitude to labor and found that it was not predictive. Two other investigators using Eysenck's instrument (Bond, 1971; Bond, 1973) did find "a low degree of neuroticism clearly linked with limitation of the experience of pain" (Bond, 1973, p. 259) and the extraversion/introversion factor related to complaint behavior, with the extraverts complaining more.

Shacham, Reinhardt, Rauhutas, & Cleeland (1983), in a study of 95 patients with cancer referred to a pain clinic, found that pain severity was significantly related to negative mood states. Lufkin and Ray (1982), in an article titled "Personality Correlates of Pain Perception and Tolerance," report that in a nonmedical population exposed to laboratory-induced pain, tolerance was related to situation variables such as cognitive focus and distraction rather than the personality variables of self-esteem and depression.

As stated earlier, investigators of postoperative pain generally consider anxiety and neuroticism. Scott et al. (1983) demonstrated that preoperative anxiety was a significant predictor of postoperative pain and trait anxiety was not predictive of any of the postoperative pain measures. They also found that information about the surgery was predictive of higher levels of pain. This finding is at odds with other research on giving information prior to surgery (Langer, Janis, & Walfer, 1975); however, it does suggest that cognitive factors do mediate pain response in some way. Martinez-Vrrutia (1975) in a study of hospitalized veterans also found an increase in state anxiety after surgery but no significant increase in trait anxiety.

Chapman and Cox (1977) investigated changes over time in anxiety, pain, and depression in a group of abdominal surgical patients. Their results indicated that patients have more anxiety and less depression preoperatively. "Patients donating kidneys or receiving kidneys from a live donor had significantly higher pain composite scores and levels of state anxiety than abdominal surgery patients" (p. 14).

Wallace (1985) found that preoperative pain expectancy was positively associated with postoperative reports of pain and high levels of anxiety. In a second study, she found that subjects given information prior to surgery had significantly less postsurgery pain than controls had. This also supports the concept of cognitive motivational mediation in the pain process as suggested by Melzack.

Reading and Cox (1985) in their study of the psychological predictors of labor pain found that pain ratings on the McGill Pain Questionnaire were high when compared to other clinical pain groups. The strongest predictor of the variance was drug use during labor followed by anxiety measured at 32 weeks' gestation. A significant association was found between pain ratings and ratings of postpartum mood, suggesting to the author an association between pain perception and personality.

A popular method of assessing postoperative pain is to examine medication usage. Since 1981, patient-controlled analgesia (PCA) has been available and in general use in most hospitals. This is a system in which the patient controls the amount and time of morphine (or other drug) usage by pressing a button. A preset computer prevents the patient from taking a dangerous overdosage. Most of the literature

indicates that with this method patients use less morphine than when they request it from the nursing staff (Bennett, Batenhorst, & Graves, 1982). Wilson and Bennett studied coping styles of general surgical patients using the amount of self-administered medication as their dependent variable and therefore their pain index. They found that patients who were independent with high levels of emotional control and who were passive consumed significantly less medication than patients with dependent, highly aggressive, and highly arousable styles.

Taenzer, Melzack, and Jeans (1986) report a study of 40 patients who had a surgical removal of the gall bladder. They used multiple regression analysis to demonstrate the extent to which nonmedical factors influenced pain perception and found that these factors accounted for 46% of the variance. Significant predictors of pain scores included trait anxiety, neuroticism, and coping styles, with the latter accounting for 28% of the variance. The highest pain scores came from the defensive high-anxious group. Of the demographic factors studied, only educational level was negatively associated with pain scores, with more educated subjects reporting less pain and accounting for 10% of the variance. Gender and age were not related to pain intensity. This study added to the evidence of the role of psychological factors in the perceived intensity of postoperative pain, and the results "suggest that the wide variability in postoperative pain, distress, and analgesic requirements is evidence of the multiple interacting influences known to underlie pain perception" (p. 340).

A study on the emotional reactions to surgery (Spielberger, Auerbach, Wadsworth, Dunn, & Taulbee, 1973) indicated an increase in

state anxiety just prior to surgery and no change in trait anxiety. Using an abbreviated version of the Minnesota Multiphasic Personality Inventory, they found no differences in pre- and postsurgery means, suggesting that the emotional stress of surgery does not affect relatively stable personality characteristics.

Twenty-two years ago, Egbert, Battit, Welch, and Bartlett (1964, cited in Egbert, Battit, Welch, & Bartlett, 1985) examined the influence of preoperative instruction and information on the amount of analgesics requested after surgery. Egbert's results showed that patients who were told what to expect and what they could do about it required significantly less morphine postoperatively than a control group ($p < .01$). In addition, the preinstructed patients were discharged an average of 2.7 days earlier than the control group ($p < .01$). This study led Egbert and others to conclude that "each patient has his own personal psychologic makeup; each patient needs "special" treatment, tailored to meet the individual's particular psychologic needs" (p. 56). In a recent review of his previous research on postoperative pain and psychological factors, Egbert et al. (1985) wrote

Again and again over the years, research has clearly shown that the physical recovery of surgical patients is exquisitely sensitive to psychological factors. As far as I know, no one has ever disputed this, so an intelligent person would naturally assume that psychologic factors are likely to be a major area of interest and concern among anesthetists and surgeons, who obviously desire their patients to recover as rapidly and as comfortably as possible. And yet it is only too clear that this area of interest has not developed. (p. 56)

In summary, there is substantial evidence that psychological factors can influence pain perception and, in turn, recovery. The question that Egbert brought up 23 years ago still remains to be

answered: What effect will this knowledge have on patient care? Furthermore, in this technological age, are we sophisticated enough to turn some of these findings into models for treatment plans based on individual personality preferences and styles? Anderson and Masur (1983) reviewed "the major psychological approaches designed to alleviate preprocedural concern and enhance recovery" (p. 1). They summarized outcome studies on commonly used preparatory techniques. These techniques included informative, psychotherapeutic, modeling, behavioral, cognitive behavioral, and hypnotic methods. The next logical step in the evolution of this type of treatment should include evaluating the individual for personality type prior to selecting the intervention. Egbert (1985) expressed dismay that this kind of psychological intervention was not coming from the ranks of anesthesiologists, yet the psychological literature has few such studies (as noted above). What is missing are reports of ongoing programs, not just limited research studies.

The Independent Variables

The Myers-Briggs Type Indicator

The Myers-Briggs Type Indicator (MBTI) was developed by Isabel Briggs Myers to test Jung's theory of psychological type. Details of the theory and the validity of the instrument are noted in Chapters 1 and 3. Since 1975, the MBTI has been available to qualified users and has been used extensively in education, management, counseling, and religion. An extensive survey of the literature revealed no use of the MBTI in the areas of medical or surgical health care.

Because there are not any studies reported in the literature on type theory and pain response, this review will address behaviors that are perceptual and cognitive motivational in nature. Gate Control theory (Melzack & Dennis, 1978) states that cognitive motivational factors play a role in the pain experience, interacting with other activities "to provide perceptual information regarding the location, magnitude and spatio-temporal properties of the noxious stimulus" (p. 12). The studies reviewed here do demonstrate that personality type may be associated with perceptual, cognitive motivational behavior so it is not unreasonable to assert that type may also be associated with other behaviors such as pain response that have a perceptual and/or cognitive motivational dimension. After a brief discussion of type distribution, cognitive motivational and perceptual studies in the areas of memory, perceptual tasks and styles, burnout, conflict handling, reading behavior, and learning styles will be reviewed.

McCaulley, Macdaid, and Kainz (1985) reported on the distribution of type in the Center for Application of Psychological Type data bank from March 1978 to December 1982. They found this sample evenly divided between extraverts and introverts, but when separated by gender, more females were extraverted than introverted. On sensing and intuition, they found sensing in the majority. On the thinking, feeling preference they found another distinction by gender, with males more likely to be thinking types and females more likely to be feeling types. The judging-perception dimension has more judging than perceptive individuals. These findings differ from an earlier survey by Myers (1962) only in the extraversion-introversion dimension when Myers

reported that 75% of the population in the United States were extraverted. McCaulley, Macdaid, and Kainz suggested that this difference may be due to a bias toward introverted intuitives in the CAPT data bank.

The literature contains several studies of type and memory. Carskadon (1979) studied memory for names as well as other variables. He found a significant difference ($p < .001$) between extraverts and introverts on memory for names, with the extraverts having the higher mean. The other behaviors that he studied at the same time were interpersonal spacing, gestures, and amount of silence in conversation. He found no significant differences in the number of gestures used by students. He did, however, find differences in the other behaviors. Introverted students differed significantly ($p < .05$) on interpersonal space from extraverted students, with the introverts taking more. As would be expected, introverted students also differed significantly ($p < .01$) on amount of silence.

In another study on memory Dunn (1985) found no differences in differential memory capacity (recall data) or differing logical strategies (clustering data) between various MBTI types using a one-way ANOVA. He does not report if he controlled for theoretical congruence and suggests that previously reported lower IQ tests and lower academic performance between types may be due to some "cognitive or motivational ability other than pure memory" (p. 32).

Carlson has published a series of studies on Jungian typology that deserve attention. In the first study she reported the use of basic memory processes. Based on the theory, the investigators (Carlson &

Levy, 1973) hypothesized that "introverted thinking types should be more effective in remembering interiorized neutral stimulus material" (p. 564). To test this they used the digit span subtest of the Wechsler Adult Intelligence Scale and found that this type was significantly superior ($p < .002$) on this task. The second part of this study hypothesized that "extroverted feeling types should be more effective in remembering novel, social, emotionally-taxed stimulus material" (p. 564). For this stimulus, they used 12 pictures from the Lightfoot Facial Expression Series. Results indicated that extroverted feeling types were significantly ($p < .002$) more accurate in recognition of facial expressions. The authors pointed out that this study did not suggest which of the dimensions, extraversion introversion, or thinking feeling, controlled the major variance. Another problem existed because of the differences in the memory tasks used. To address this problem, Carlson conducted a second study of the same hypothesis using a uniform memory task designed to contain both types of content. This task required subjects to recall numbers and names. The results were the same as in the first study, with the introverted thinking types more effective in "using memorial processes with objective impersonal material" (p. 567) and extroverted feeling types responding to the "social implications of the stimulus material" (p. 567).

In a third study reported in the same paper (Carlson & Levy, 1973), the investigators hypothesized that, based on Jung's theory, "the importance of the perceptual functions (judging versus perceiving) and the quality of one's perception (sensation versus intuition)" (p. 568) would play a role in how we interpret another person's experience. An

"emotional recognition task" (p. 568) appropriate for use with black students was developed following the general procedures used in developing other facial expression instruments. As predicted, they found "intuitive perceptive types significantly more accurate in interpreting emotional expressions than were sensing judging types; women were significantly more accurate than men" (p. 569).

In the last study reported in this paper the investigators examined the relationship between typology and volunteer service. The hypothesis was that extroverted intuitives would have an empathetic approach to others and therefore be "over represented among social service volunteers as compared to a matched group of nonvolunteers" (p. 571). The results confirmed this hypothesis.

The authors believe that the above four studies, although limited in scope and carried out with small samples, have important implications for social science research in the area of behavioral mediators or influences.

They suggest that complex, enduring organizations--which go beyond familiar alternatives of "state" or "trait" conceptions --must be considered in posing questions or generalizations about relationships of personality and social behavior. They point to the usefulness of Jungian type theory as a conceptual framework capable of generating new insights into person-situation relationships. (p. 573)

In another paper that Carlson called "Representations of the Personal World" (1980), she again addressed memory but this time in a field study as opposed to the previous laboratory study, and the results supported previous research. The author expressed the belief that Jungian type theory is underutilized and that these studies "clearly demonstrate that Jungian type theory need not remain an isolated

theoretical system. Its implications are translatable into more familiar concepts and methods of psychological inquiry and are equally capable of interfacing with other theoretical formulations" (p. 809-810).

Ware, Yokomoto, and Paul (1984), in a study extending the research on behavioral construct validation of the MBTI, tested 50 subjects using two standard laboratory perceptual motor tasks, the mirror star tracing apparatus and the stylus or finger maze. They found extroverts "consistently performed faster and with fewer errors on the star tracing, though not on the maze" (p. 27). One important objective of this study was to determine if theoretically congruent subjects differed from theoretically incongruent subjects, and they found a significant difference in the two groups ($p < .01$). This suggests that type differences may influence performance in selected perceptual motor tasks, and, more specifically, that the extent of the behavior may be related to theoretical congruence.

Holsworth (1985) in a study of perceptual style correlates of the MBTI examined "the relationship between the Jungian perceiving function as measured by the Myers-Briggs Type Indicator (MBTI) and the perceptual style of field dependence/independence as measured by the Group Embedded Figures Test (GEFT)" (p. 32). Field-independent individuals are "capable of overcoming the embedding context of stimulus presentation in order to examine elemental aspects of the field in a novel or creative manner" (p. 32). Results of this study suggest that behavioral correlates of perceptual style do exist. Using regression analysis, Holsworth found that "the more intuitive and introverted an individual

was, the more likely he or she was to employ a field independent style" (p. 34). The opposite effect of field dependence was related to sensing.

Another perceptual study by Ware, Wilson, and Yokomoto (1986) involved time spent looking at selected photographs by Jungian personality types. Previous investigations of this behavior had focused on the extraversion/introversion dimension, and these investigators thought that the thinking/feeling dimension might be related to this behavior. Their hypothesis was based on Jung's theory that "thinking types with their preference for logic and analysis and a tendency to weigh the facts may take longer than feeling types" (p. 59). They found this to be true and also found that it may be moderated by the extraversion/introversion dimension with extroverted thinkers looking longer than introverted thinkers and introverted feelers looking longer than extroverted feelers. The authors point out that this has significance in education.

Garden (1985) investigated burnout behavior in relation to personality type. She was most interested in the thinking/feeling dimension since most of the previous studies had been done in the human services which are largely comprised of feeling types. She studied students in an MBA program and examined their behavior during burnout. The measure of burnout was chronic energy depletion that was "not renewed by the usual means of rest or sleep," (p. 5). The behaviors she tested were distancing, hostility, lack of concern for others, and not needing others. Results indicated that during burnout, feeling types have a more "negative reaction to people, the more depleted of energy

they are" (p. 6) and thinking types "could be described as more positive than negative, as their energy depletion becomes more severe" (p. 6). She concludes that "negative reaction to people during burnout is not a generalizable finding" (p. 7). She addresses the issue that these findings are the opposite of what would be predicted based on type theory and suggests that a "reversion" takes place which "reflects an inability or unwillingness to use the conscious function upon which one has come to rely" (p. 8). When she examined the sample on the sensing-intuitive dimension, she got similar results. Sensing types showed decreasing groundedness, and groundedness in reality is one of the distinguishing features of the sensing-intuitive dimension. This study clearly supports the concept that psychological type influences behavior in different ways for different types.

In light of the "reversion" reported above, the reliability of the indicator is pertinent. McCaulley in her chapter in Advances In Psychological Assessment (1980) reviewed the reliability studies. In addition, in the latest version of the MBTI Manual (Myers & McCaulley, 1985) the authors have included a chapter on reliability. In both of these sources the authors concluded that

Test-retest reliabilites of the MBTI show consistency over time. When subjects report a change in type, it is most likely to occur in only one preference, and in scales where the original preference was low. (p. 171)

Carlyn (1977) reported that in a review of studies of the independence of the categories, the EI, SN, and TF scales appeared to be independent of each other. She reported,

The findings with both type category scores and continuous scores indicate that the Myers-Briggs Type Indicator measures three dimensions of personality that are relatively

independent of each other: extraversion-introversion, sensation-intuition, and thinking-feeling. The instrument also measures a fourth dimension of personality, judgment-perception which appears to be related to at least one of the other dimensions. (p. 463)

Carlyn's report of the stability of the indicator using type category scores and continuous scores is similar to McCaulley's (1981, 1985) finding of test-retest agreement significantly higher than would be expected by chance. Further data on reliability are reported in Chapter 3.

Another behavior that appears to be influenced by psychological type is that of conflict handling. Kilmann and Thomas (1975) did a laboratory study of conflict handling behavior with 86 male management students. They report that feeling types were more accommodating, less assertive, less willing to compete, and more willing to be cooperative than thinking types. They did not find differences in behavior on the sensing-intuitive dimension or the judging-perceiving preferences. However, they found the strongest and the most consistent correlations on the extraversion-introversion dimension, with extraverts being more integrative, more assertive, and more cooperative than introverts in conflict-handling behavior. Although this study did support the concept that psychological type as described by Jung influences behavior, a reminder is in order that the study was limited because the population was all male business students, and these findings may not generalize to other populations.

Hicks (1984), in a study of the posited dichotomy of the sensing intuition scale of the MBTI, used book reading behavior of adults as an external variable that was theoretically relevant. The SN scale was

chosen because "among the four MBTI scales, SN has been shown to be the one that behaves most like a cognitive style measure" (p. 120). Results indicated that the distribution of the SN scores was not bimodal, and intuitives ranked books first significantly more than did sensing types ($p < .001$). Hammer (1985) in another study of media preference and type also examined book reading behavior of an adult population. He found no "significant main effects or interactions involving any of the MBTI scales on number of fiction books read, total number of books read or hours of television watched per day" (p. 22). These results differed from those reported above by Hicks (1984). However, Hammer pointed out that "Hicks herself suggested that the difference between sensing and intuitive subjects on book reading might be reduced if subjects were sampled from settings with richer leisure opportunities compared to the isolated rural setting where her data were collected" (p. 25). These two studies suggest that the behavior of book reading may be related to type given certain conditions. More research is needed to define those conditions.

A review of perceptual and cognitive motivational studies and type theory should not end without Lawrence's (1984) review of research on learning style and type. Lawrence explained the aspects of psychological make up of learning styles:

- a) Cognitive style in the sense of preferred or habitual patterns of mental functioning: information processing, formation of ideas and judgments.
- b) Patterns of attitudes and interests that influence what a person will attend to in a potential learning situation.
- c) A disposition to seek out learning environments compatible with one's cognitive style, attitudes and interests, and to avoid environments that are not congenial.
- d) Similarly, a disposition to use certain learning tools and avoid others. (p. 2)

From this paradigm Lawrence presented studies that show "correlations of the MBTI with other measures" (p. 2), "studies that have used the MBTI to identify style" (p. 5), "studies attending to Types" (p. 11), and finally a series of tables that summarize the findings. Briefly, extraverts prefer group learning, discussion, and hands-on activity, as opposed to introverts' preference for reading and working alone. Sensing types prefer step-by-step instruction while intuitives like to "find their own way in new material" (p. 12). Thinking types like objective material while feeling types want personal rapport. Judging types will "work in a steady orderly way" (p. 12), while perceptive types "work in a flexible way following impulses" (p. 12). The author pointed out the need to design programs with type in mind, even in the most casual instructional situation, to maximize learning. One of the major problems in health care today is noncompliance, and patients are "blamed" for this behavior. Perhaps they were never taught what they had to do in a way that was meaningful to them.

The Millon Behavioral Health Inventory

The Millon Behavioral Health Inventory (MBHI) was developed over a 4-year span of research as a "general purpose instrument of a psychological nature designed for use in a wide range of medical settings" (Millon, Green, & Meagher, 1979, pp. 529-537). In the belief that mind-body interactions could affect the outcome of disease and treatment, the authors did an extensive review of the literature in search of an instrument designed to assess patients in a medical

setting. They found instruments such as the Minnesota Multiphasic Personality Inventory (MMPI) and the Sixteen Personality Factor Questionnaire being used in medical settings even though they were developed for use in psychiatric settings and at best "are only tangentially related to medical issues" (p. 532). Another instrument, the Cornell Medical Index, is not considered appropriate for research because "the developers of the instrument did not intend to calculate score totals or scales," (p. 531) and it is "naive in construction and has not been recommended as especially incisive or illuminating as a medical-behavioral tool" (p. 531).

As their research continued, the authors found many other instruments that might be appropriate except for the fact that they were single focused and not multidimensional in scope. The MBHI was developed to reflect personality styles; "these were derived as "normal" variants of personality from a theory of personality pathology" (p. 534); psychosocial stressors "selected on the basis of their support in research literature as significant and salient factors that contribute to the precipitation or exacerbation of physical illness" (p. 534); psychosomatic correlates "empirically derived by differentiating patients with the same physical syndrome in terms of whether their illness was or was not substantially complicated by social or emotional factors" (p. 534); and prognostic indices to "identity future treatment problems or difficulties that may arise in the course of the patient's illness" (p. 534). (A brief description of these scales appears in Chapter 3, and a detailed description can be found in Appendix A.)

A review of the literature on the MBHI has revealed no studies of the relation between scores on this instrument and postoperative pain response. However, a few are marginally related in that they deal with perceptual cognitive-motivational behaviors.

Foster (1977) studied psychiatric patients for inclusive behavior. He believed that the "rigidity of coping styles in a psychiatric population tends to perpetuate extreme styles which are found in a lesser degree in a normal population" (p. 227). He hypothesized that subjects with active personality profiles would "be more cautious--select fewer words" (p. 228) than those with passive personality profiles, and this was substantiated ($p < .02$).

Sweet, Breuer, Hazlewood, Taye, & Pawl (1985) report a study of the MBHI in a chronic pain clinic. Fifty-two patients were tested and evaluated independently for treatment outcome. Although the investigators found that "individual MBHI scales were able to classify positive and negative outcomes with comparable accuracy" (p. 224), they cautioned the use of this instrument with chronic pain patients until further research is available. "While the MBHI seems to have potential for predicting treatment responsivity with chronic pain patients, the lack of specificity of the scales and the degree to which MBHI responses are affected by the presence of denial of psychological problems are problematic" (p. 224).

In another study of chronic pain patients, Levine and Meager (1983, cited in Sweet, Bruer, Hazlewood, Taye, & Pawl, 1985) examined the scales in relation to response to biofeedback training and found that patients with elevations on the sociable and confident style scales did

well and those with elevations on future despair and somatic anxiety did poorly. The pain treatment response scale (in which high scores indicate that psychological factors may maintain the pain behaviors) was not related to biofeedback response. However, in another study of 30 cancer patients (Rozensky, cited in Sweet et al. 1985), high scores on this scale were related to biofeedback response.

The treatment of cancer with chemotherapy often results in nausea and vomiting. Psychologists are interested in the anticipatory nausea/vomiting experienced by patients after a few chemotherapy treatments. Van Komen and Redd (1985) reported a study of 100 patients receiving chemotherapy in two clinics in Illinois. The MBHI was administered to 59 of the patients. They found that high scores on the future despair, social alienation, and inhibited personality style scales of the MBHI was associated with higher anticipated nausea in this group of patients.

Another study of nonsurgical pain was reported by Richter, Obrecht, Bradley, Young, and Anderson (1985). Twenty patients with noncardiac chest pain and 20 patients with irritable bowel syndrome (IBS) were compared to three control groups. The noncardiac chest pain patients had a "syndrome characterized by exceeding high amplitude peristaltic contractions in the distal esophagus" (p. 132). This motility disorder has been called the "nutcracker esophagus (NC)" (p. 132). These two groups were evaluated for psychological problems associated with their diseases using the MBHI. "The mean scores of the IBS and the NC groups were greater than the control groups on the scales for gastrointestinal susceptibility ($p < .0001$), somatic anxiety ($p < .001$), and future

despair ($p < .02$)" (p. 134). In general, although the two gastrointestinal syndromes yielded similar results on the MBHI, the IBS patients had far more generalized psychological problems than the NC patients. For this reason the investigators concluded that different treatment modalities would be appropriate.

As stated above, the literature contains few published studies of the MBHI, and most of those are only marginally relevant to this study. Millon developed the test because he felt that instruments developed and normed on psychiatric patients are not appropriate for medical or surgical patients. Others do not agree with him. In a recent review of the MBHI, Rustad (1985) stated, "There is no convincing evidence that the Minnesota Multiphasic Personal Inventory is, per se, inappropriate for medical patients. Available research indicates that medical illness is unlikely to change scales more than a few raw score points" (p. 281). In addition, Rustad suggested that because of "lack of normative and case history data and interpretive aids, the dearth of published cross-validation data, and the resultant problems in interpretation, it is difficult at present to recommend the use of this inventory (the MBHI) as a clinical instrument without serious reservations" (p. 281).

At least two other reviewers agree with Rustad, stating that lack of cross-validation studies and overlapping of test items make it difficult to evaluate potential utility (Allen, 1985; Lanyon, 1985). Another complaint is the lack of theory in the manual. The eight basic coping styles are purportedly based on Millon's theory of biosocial development, yet there is no explanation of the theory available. All three reviewers (Allen, 1985; Lanyon, 1985; Rustad, 1985) suggested that

until there is some "empirical evidence for the validity of the computer narrative interpretation and the usefulness of the test in medical settings" (Allen, p. 983), use of this instrument should be limited.

Richter et al. (1985), on the other hand, suggested, "It may be worth while to employ the MBHI or similar psychometric instruments as screening devices to obtain some estimate of which patients might be likely to suffer psychological difficulties that may adversely affect the course of their illness" (p. 137). One would have to conclude that, at best, the MBHI has mixed reviews, and certainly further research is needed before it is used for substantive judgments.

Health Locus of Control

The basic concept of locus of control comes from social learning theory as defined by Rotter (1954). He believed that "behavior potential is a function both of the expectancy that reinforcement will follow the behavior, and the perceived value of the expected reinforcement," (cited in Maddi 1980, p. 625). Coming from this belief is Rotter's construct on internal versus external locus of control. This construct concerns an expectancy that people either have control over events in their lives or that they are subject to manipulation and control by outside factors. On a personal level, those with internal control "are more individualistic, assertive, interested in gaining knowledge, and willing to rely upon their skill in risky situations than are persons believing they are externally controlled" (p. 632). In spite of the fact that personologists have been enthusiastic about this construct, calling it "an intuitively and rationally compelling concrete

peripheral characteristic" (p. 633), considerable conflict persists regarding its validity. Factor analytic studies of this construct (Lindbloom & Faw, 1982) have yielded more factors than the theory accounts for on the generalized scale. Wallston, Wallston, Kaplan, and Maedes (1976) suggest that an explanation of these contradictory findings may be found in the theory.

According to this theory, it is assumed that increasing an individual's experience in a given situation will lead to the development of specific expectancies. These expectancies subsequently play a greater role in determining one's future behavior in that situation than more generalized expectancies. It stands to reason that research whose aim is the prediction of behavior in specific situations could profit from the use of more specific expectancy measures. (p. 580)

The authors believed that a health-related locus of control scale would provide more sensitive predictions of the relationship between locus of control and health behavior.

Richard Lau (1982) conducted a study "to explore possible determinants of health locus of control beliefs" (p. 323). Using a multidimensional health locus of control battery, he found that early health habits concerning self-care, such as brushing teeth, getting exercise, getting enough sleep, proper nutrition, and other health habits regarding utilization of the medical profession were positively correlated with internal health locus of control. Recent illness was not related to either internal or external control, suggesting that health locus of control could be a stable trait. Another factor related to internality is socio-economic status, with higher SES subjects being positively correlated with internality. A surprising result of his survey was that having a physician in the family was not a significant factor in determining locus of control.

Williams and Stout (1985) studied assertiveness, locus of control, and health problems. They found that "highly assertive participants were significantly more internally controlled than were participants low in assertiveness ($p < .05$)" (p. 171). In addition, they found that these highly assertive subjects also had significantly fewer health problems ($p < .05$) than low assertive people.

Strickland (1978) did an extensive review of the research on internal-external (I-E) locus of control expectancy and health attitudes and behaviors. In the area of health knowledge and precautionary measures she reported that,

With some exception, the bulk of the reported research on I-E and the precautionary health practices lends credence to the expected theoretical assumptions that individuals who hold internal as opposed to external expectancies are more likely to assume responsibility for their health. (p. 1194)

For those people who were already sick, internals were more likely to comply with diet restrictions and keep appointments. Among the pre-surgical patients internals have less anxiety. She cited another review that stated "except in two cases in which internality was linked with high anxiety, externality was always associated with undesirable physical characteristics such as higher temperature and higher sedimentation rates" (p. 1197). Other evidence of the relation between the I-E construct and physiological adaptive responses can be found in the biofeedback literature. "Results of several studies do show internals to be generally superior to externals in responding to biofeedback paradigms" (p. 1198).

On the other hand, Johnson and Thorn (1985) tested 48 subjects on two perceptual tasks known to elicit changes in heart rate. The changes

did occur, but they were not related to locus of control. In the area of psychological health Strickland reports that internals "are significantly more likely to report themselves as content with their life situations than externals" (p. 1200). Participants in a fitness program tested by O'Connell and Price (1982) were also more likely to be internals.

A study on locus of control and response to dental surgery (Auerbach, Kendall, Cutler, & Levitt, 1976) found that internal subjects who were given specific information about the surgery responded better than internals given general information. Conversely, external subjects responded more favorably to general information. Clum, Scott, and Burnside (1979) studied patients having elective cholecystectomies. They reported that the amount of information internal patients had about the surgery was related to the number of analgesics taken and their present pain index with the greater amount of information resulting in an increase in these outcome measures. Externals, however, only had an increase in the present pain index with increased information. Another study on cholecystectomy patients (Wise, Hall, & Wong, 1978) found externals were more depressed but used no more medication than internals.

As stated above, the construct of locus of control is still under investigation. If the construct is valid, internals are probably better prepared to cope with matters pertaining to their health.

The Subjects

Subjects in this study were a mixed sample of gastric bypass and hand surgery subjects. The psychological literature contained no references to hand surgical patients in particular, only references to surgical patients in general, and these are discussed elsewhere. Benedetti, Bonica, and Bellacchi (1984) reviewed the literature on post-operative pain and published a chart comparing incidence, intensity, and duration of pain for various types of operations. They admitted that these are "rough estimates" (p. 374). However, they do provide a way of comparing different surgeries. For an intraabdominal gastrectomy, a procedure similar to the gastric bypass, the investigators say that 20-30% of the patients have moderate steady wound pain, 50-75% have severe steady wound pain, 25-35% have moderate pain on movement, and 65-75% have severe pain on movement; the duration of the moderate to severe pain is 3 days with a range of 2-6 days. For the hand surgery patients they report that 15-20% of them have moderate steady wound pain and 65-75% have severe steady wound pain; 40-50% have moderate pain on movement and 50-60% have severe pain on movement; the duration of moderate to severe pain is 3 days with a range of 2-6 days. Keeping in mind that their review covered a number of published studies, done over several years, by different surgeons, with different anesthesiologists and in different hospitals, and not controlling for socioeconomic or psychological variables, there may be little difference in incidence, intensity, and duration of postoperative pain between patients who have upper intraabdominal surgery and patients who have hand surgery.

Obesity

The gastric bypass procedure is a surgical intervention for the treatment of morbid obesity. Morbid obesity is defined by Charles (1983) as "weight 100 pounds greater than, 100% over, or at least 200% of, ideal body weight" (p. 122).

Several investigators have sought to answer the question of whether the morbidly obese have a greater incidence of psychopathology than the rest of the population. In a recent issue of Integrative Psychiatry, eight psychiatrists and psychologists who treat and evaluate obesity and other eating disorders reviewed the lead article by Charles (1983). Below is a summary of Charles' article and the commentary of her peers. In her review of the psychological status of the morbidly obese, she made the following statement:

Because morbidly obese patients appear so "extreme" in terms of body weight, the common assumption is that major psychopathology plays some role in its development and/or maintenance. Studies to date are conflicting and have not established if such patients have a higher degree of psychopathology than obese persons or the general population. A contributing factor to the apparent discrepancy among study findings may be the fact that there are subgroups of this population who are more available for study and who are more highly vulnerable to psychiatric disability. (p. 122)

The distinction between morbid obesity and other obesity was not made until the late 1950s when surgical procedures were developed to aid in weight loss. Psychologists and psychiatrists had decided that super-obesity was an "extreme defense mechanism" (p. 123), and one study reported that "97% of their 31 subjects had a psychiatric diagnosis" (cited in Charles, 1983, p. 123). Since those early studies using psychiatric diagnoses as a way of describing the problem, other studies

that have been done using this criterion producing mixed results. Charles felt that since certain subgroups are more vulnerable to psychiatric disability, some subsets of morbidly obese patients may exist who have a greater degree of psychiatric disorders. She called for "studies of nonsurgical morbidly obese patients not currently registered in medical or psychiatric clinics and presumably functioning well in society" (p. 124). She estimated that there are 600,000 morbidly obese people in the United States.

Blackburn (1983) makes the statement that "morbid obesity is a serious mental disease that is generally poorly treated and currently exists in epidemic proportions" (p. 126). He expressed the belief that it is genetic in origin and that the most successful treatment is a combination of exercise, gastric bypass, cognitive restructuring, educational training, and self-help. Despite his calling it a "very serious mental disease," he added that "it would be a mistake to assume that overweight people have psychological dysfunction in greater numbers than the general population" (p. 127).

Hagan and Johnson's (1983) commentary on Charles' article cited evidence that the morbidly obese and the moderately obese do not differ on MMPI profiles. They concluded that the conflict of findings in the literature supports Charles' hypothesis that subgroups among the morbidly obese may exist.

Wise (1983) reported on 35 morbidly obese Fairfax Hospital patients who underwent nonsurgical treatment using the modified protein fast. He found that the group of patients exhibited "preoccupation with food and emotional distress but not the emergence of major mental disorders"

(p. 128). He suggested other areas that should be investigated are the availability of the surgery and "the role of obesity within the person's social system" (p. 128).

Castelnuovo-Tedesco (1983) agreed with Charles that more research on morbid obesity is needed and pointed out that most of the studies are on white women who have sought bypass operations. He calls for more studies involving men and minorities. Regarding the research on the possibility of psychopathology, he wrote that

To the surprise of many, extreme psychopathology (psychosis, crippling neurosis) has turned out to be rare among the super-obese, who in fact often show substantial, at times remarkable, personal and social effectiveness. (p. 129)

Schowalter (1983) expressed the belief that obesity is an eating disorder like anorexia. He suggested that "people with eating disorders appear at risk for depression, whether as cause or effect" (p. 130). Pointing out that anorexia patients are more depressed and suicidal when they are gaining weight, he suggested that perhaps the opposite is true of the obese patient and that eating relieves depression in this group. He did point out that he tended to "see only obese individuals troubled enough to seek help" (p. 130).

Kral (1983), in a discussion of the limitations of epidemiologic studies of the morbidly obese, agreed with the assumptions of Charles that subgroups exist. Furthermore, he stated that because of inclusion and exclusion processes in selecting subjects there are "no truly randomized population studies from which morbidly obese patients have been selected" (p. 131). The inclusion processes can include "criteria related to weight, duration of overweight, age, treatment history,

medical complications, alcohol or drug abuse, informed consent, and cooperation" (p. 131). Exclusion processes can be active or passive. Patients can be actively excluded because "they do not meet the inclusion criteria or passively because they are not referred or recommended for such surgery, or because surgery is unavailable or because they are unwilling to accept surgery out of fear or misinformation" (p. 131). Because of these and other reasons, he stated that we need "well designed epidemiological studies to characterize the morbidly obese" (p. 132).

Klykylø (1983) expressed doubts that neurotic conflicts necessarily are involved in obesity. "The psychic utility of a condition or behavior to an individual in no way establishes causality" (p. 133). He added that because of its relation to nutrition, obesity could be a very "utilitarian defense" (p. 133). Speaking of the possibility of antecedents to adult obesity, he suggested comprehensive studies of childhood obesity with the possibility of intervention and prevention.

Stunkard (1983) referred to 11 studies that "failed to find subgroups of morbidly obese persons" (p. 126). He pointed out that the reason psychological assessments are done at all is to determine suitability for surgical intervention and that this determination "is not likely to be greatly affected by the knowledge that in general, morbidly obese persons have more, or less, psychopathology than others" (p. 126).

Noppa and Hallstrom (1981) studied body weight changes and excess weight over a 6-year period in 1,302 middle-aged Swedish women. They found weight gain and excess weight more common among single women. The

Eysenck Personality Inventory and the Cesarec-Marke Personality Schedule indicated that the weight change group had significantly higher order scores than the excess weight group. Aggressive nonconformance was lower in the weight change group ($p < .05$). No other significant differences were found. In the mental health variables they found that groups that gained more than 5 kilograms had higher psychopathology ratings than groups that gained less. This was measured by disability degree ($p < .05$), depth of depression ($p < .05$), and the Hamilton Rating Scale ($p < .01$). The authors concluded that "in the long run, women with depressive symptoms seem to run an increased risk of developing obesity" (p. 86), and "the personality variables studied seem to be of only minor importance for the development of obesity in adult life" (p. 86).

Webb, Phares, Abram, Meixel, Scott, and Gerdes (1976) report on the evaluation of 70 patients for "psychological features" prior to bypass surgery (p. 83). The evaluation consisted of a psychiatric interview, a short form of the WAIS, the MMPI, Rorschach, a sentence completion blank, and the Tennessee Self-Concept Scale. Eight were considered unfavorable for surgery. Only one of these was psychotic; the other seven had severe personality or psychoneurotic disorders. The investigators diagnosed 56 of the surgical candidates as having mild personality disorders, 3 with psychoneurotic disorders, none as being psychotics, and 6 as being normal. The authors concluded that on a "group basis, their personality problems were within normal limits" (p. 85), "that severe psychological problems are rare, but that mild emotional immaturity is frequent, indeed modal" (p. 85).

Hutzler, Keen, Molinari, and Carey (1981), in an ongoing study to "describe the type of person who seeks this radical measure (bypass surgery)" (p. 461), reported that "they consider themselves unattractive, manifest low self-esteem, and almost half of them have significant psychopathology" (p. 461). In a later investigation Rosen and Aniskiewicz (1983) found that bypass patients had significantly "higher levels of psychosocial stressors, and lower levels of adaptive functioning" (p. 53). They also had a significantly higher frequency of past suicide attempts and higher levels of depression. Duckro, Leavett, Beal, and Chang (1983) in a study of 199 morbidly obese patients, identified three profile groups using the MMPI. Profile 1 had adequate psychological resources and a positive self-image. Profile 2 were "unhappy and tense with limited social skills and self-confidence" (p. 481), and Profile 3 were angry and hostile with a "history of problems in close relationships" (p. 481).

In a study of bypass patients and pain Rand, Kuldau, and Yost (1985) found that the bypass patients required significantly less medication for pain postoperatively than a group of cholecystectomy patients. The authors did not know the reason for this observation but suggested that "if both eating and pain sensitivity are at least in part under the control of endogenous opiates, then morbidly obese adults should experience less postsurgical pain than normal weight adults" (p. 43).

The implication in the above brief review of the literature on morbid obesity is that the incidence of psychopathology in this population is low and may not differ from that in the general population

or that among the morbidly obese who do not seek surgical intervention. To date, no research either empirical or ethnographic has uncovered a profile of patients psychologically at risk for gastric bypass procedures. Certainly, physical risk of this condition may far outweigh any psychological risk.

The Dependent Variable

The measurement of pain has intrigued clinicians and researchers for centuries, but satisfactory quantification has as yet not been entirely achieved. Major stumbling blocks are the lack both of a generally accepted definition of pain and of knowledge concerning the nature of the adequate stimulus for pain. (Wolff, 1978)

In spite of the above problems, clinicians and researchers continue to attempt to measure pain because it has such an important impact on the patient, the family, and the general outcome of treatment. Approaches to the measurement of experimental pain are psychological, involving the measurement of different sensory modalities and more recently a technique "for separating the purely sensory characteristics of the pain response from the individual's attitudinal and judgmental components of the pain response" (Wolff, p. 143). Clinical pain, on the other hand, is measured by the patient's response, since the exact stimulus is rarely known. The patient's response includes behaviors such as blood pressure, pulse rate, galvanic skin response, body posture, verbal reports, medication usage, and direct scaling techniques. The McGill Pain Questionnaire (Melzack, 1975) is a direct scaling technique. In the review of the literature on this instrument, none of the studies relate to psychological type, but many relate to other components of personality.

Melzack (1983), who proposed a motivational-affective dimension of pain in his gate control theory reviewed above (Melzack & Dennis, 1980), described the experience as follows:

Pain has a unique, distinctly unpleasant, affective quality that differentiates it from sensory experiences such as sight, hearing, and touch. It becomes overwhelming, demands immediate attention, and disrupts ongoing behavior and thought. It motivates or drives the organism into activity aimed at stopping the pain as quickly as possible. To consider only the sensory features of pain and ignore its motivational and affective properties is to look at only part of the problem, and not even the most important part at that. (p. 3)

From this perspective he developed the McGill Pain Questionnaire to measure the sensory, affective, and evaluative dimensions of pain, the intensity of each dimension and the "patient's evaluation of the overall intensity of the pain" (p. 4).

Gracely (1983) proposed five properties of an ideal pain measure. They include (a) freedom from bias that would lead to overestimate or underestimate the pain, (b) the provision of immediate feedback to the patient, (c) separation of the sensory aspects from the affective and evaluative aspects, (d) utility for measurement of clinical and/or experimental pain, and (e) absolute measure to determine between- and within-group changes. Gracely expressed the belief that the McGill Pain Questionnaire has all of these properties.

In a study to determine the validity of using the McGill Pain Questionnaire for assessing postoperative pain, Taenzer (1983) reported "results indicate that the McGill Pain Questionnaire and the visual analogue scale are valid and appropriate indices for assessing postoperative pain. Both appear to reflect the clinical course of postoperative pain and reflect the patient's affective state" (p. 117).

Significant correlations were found between pain scores, expected anxiety, and the Beck Depression Inventory.

Burckhardt (1984) and Lichtenberg, Swensen, and Skehan (1986) used the McGill Pain Questionnaire to study arthritis patients. Burckhardt found that arthritis patients used similar sets of words to describe sensory aspects but that most of the variance was accounted for by the affective dimension. Lichtenberg, Swensen, and Skehan found "high pain scores associated with abnormal concerns over bodily functions and vague somatic complaints" (p. 334). In another study Kremer, Atkinson, and Kremer (1983) found affective descriptors of the McGill Pain Questionnaire associated with psychiatric disturbance in chronic pain patients accounting for 44% of the variance while the sensory dimension accounted for only 2% of the variance.

Parker, Doerfler, Tatten, and Hewett (1983) investigated the relationship among the MMPI, the Beck Depression Inventory, and the McGill Pain Questionnaire. The subjects were 30 male VA patients with pain of longer than 3 months' duration. The investigators found that depression was not related to any of the scales, and personality traits were not related to the sensory or evaluative scales. They did find a positive correlation between elevated Pt (psychasthenia) scale of the MMPI and the affective dimension of the McGill suggesting that "pain reports sometime function as outlets for psychologically based distress" (p. 24).

In other studies Bradley (1983) and McCreary (1983) reported relationships between the Neurotic Triad scales (depression,

hypochondria, and hysteria) of the MMPI and the affective dimension of the McGill Pain Questionnaire.

Diller (1980) wrote that because of the variety of specific pain terms, some type of cognitive sorting must take place when describing the experience. The terms we use for pain may function on more than one level so Diller finds the McGill Pain Questionnaire useful in distinguishing the levels. "In this way it may become possible to connect more certainly the tertiary and quaternary accounts of pain and to associate linguistic descriptions with quantitative clinical measurements" (p. 10).

Gaston-Johansson (1984), in a study to determine if the concepts pain, ache, and hurt differ from each other in intensity, gave the McGill Pain Questionnaire and a visual analogue scale (VAS) to 41 registered nurses and 12 chronic pain patients. She did a pairwise comparison of pain versus ache and ache versus hurt using the visual analogue scale, the number of words chosen scale, and the pain rating index scale of the McGill Pain Questionnaire. The investigator found significant differences between the words on all three scales for the nurses' rating. The patients chose fewer words to rate intensity than the nurses chose. She recommended using the word hurt on the lower end of a scale and pain on the higher end, concluding that her findings confirm a difference in intensity between the words.

A conclusion from the above studies is that the McGill Pain Questionnaire is an appropriate instrument for measuring both acute and chronic pain. Evidence exists that this instrument may also

discriminate between different diagnoses. The variety of terms and the format discourage set response bias, and the rating of the word intensities appears valid.

In this study the various scales of the McGill Pain Questionnaire were the dependent variable. The Myers-Briggs Type Indicator and the Millon Behavioral Health Inventory were used to assess the personality types and coping styles.

CHAPTER 3 METHODOLOGY AND INSTRUMENTATION

The basic research questions of this study were as follows: Is personality type associated with a particular type of pain response? That is, is type associated with sensory, affective, or evaluative responses? Additionally, is coping style associated with pain response? If so, in what direction?

Ten local surgeons were contacted by mail (see Appendix B for the letter) and asked to assist in this study by allowing the investigator to contact their patients. Five replied enthusiastically and were willing to participate. However, because of their busy schedules, their office staffs would have to become involved and actually make the initial patient contact regarding possible participation. Because of insurance regulations, surgeons do not schedule operations until approval is received from the insurance companies (unless the operation is an emergency). Therefore, patients initially visit a surgeon primarily for consultation; if the decision to operate is made, the office staff files the necessary papers with the insurance company, and upon receiving the reply, schedules the surgery. After the surgery was scheduled, the patients were contacted about my study. As a result of these complications, the sample was drawn from the patient populations of only two surgeons, one a general surgeon who specializes in gastric bypass procedures and a hand surgeon who owns his own hospital. In each

case the data collection procedure differed slightly. For the general surgeon, once they scheduled the surgery, I mailed to the patients a packet containing all the research instruments, the consent form (see Appendix C), and a letter of explanation with a stamped self-addressed envelope for return. A member of the office staff kept a list of patients who had received the packets, the date of the surgery, the hospital, and the type of surgery. I visited the patients on the third postoperative day (approximately 86 hours after surgery) to assess their pain, using the McGill Pain Index.

Data from the hand surgery patients were collected in a slightly different manner. The surgeon has two offices, one in Gainesville, Florida, a university community classified as a standard metropolitan statistical area, and the other 28 miles away in the small rural farming and forestry community of Lake Butler. I divided my time between the two offices, seeing patients in his conference room, explaining the study, and asking them to participate. Because many of the patients had accidental injuries to their hands, their surgery was done with deliberate speed. When possible, these patients were seen before their operation, or at least in the same day. Those who agreed to participate and completed their questionnaires returned them in a few days.

Over an 8-month period 167 packets of research materials were distributed. Of these, 103 were mailed from the general surgeon's office and 40 were returned, a 39% return rate. Two of the 40 were dropped because of incomplete data. Thirty-two of the remaining 38 subjects were gastric bypass patients. The remaining six were dropped

from the sample to have a more homogeneous group. The same physician did all of the gastric bypass procedures. Of the 64 packets given to the hand surgery patients, 25 were returned representing a 39% return, and 3 were dropped for incomplete data. The 22 remaining subjects included 12 patients who completed the McGill Questionnaire within 4 days of surgery, and 11 who were not recently postoperative but who were being treated at the hand rehabilitation clinic after their surgery for continued pain.

Subjects

The 55 volunteers who had either a gastric bypass procedure or hand surgery were divided into three groups. Group I consisted of the 32 morbidly obese patients who had gastric bypass. Group II comprised the 12 patients having hand surgery and completing the McGill within 4 days. Group III consisted of 11 patients not recently postoperative but having hand rehabilitation treatment for continued pain. The mean age of the 55 patients was 40.5 years, with a range of 17-82. The sample was made up of 41 females and 14 males.

Instruments

The instruments used in this study were the Myers-Briggs Type Indicator (MBTI) to assess personality type, the Millon Behavioral Health Inventory (MBHI) to control for psychogenic attitudes and assess coping styles, the Health History Questionnaire (HHQ) to assess the number of symptoms, the Wallston Health Locus of Control Scale to

control for locus of control, and the McGill Pain Index (MPI) to assess perceptive response to pain. A description of the instruments follows.

The Myers-Briggs Type Indicator

This test measures personality constructs described by Jung. It consists of four basic scales, each with two bipolar dimensions that, when combined, result in 16 different categories of types. The theory states that "the basic differences concern the way people prefer to use their minds" (Myers, 1980, p.1). All of the functions are available to each individual, but over time and with experience, each person develops a preference. The following characteristics are measured by the four scales:

1. Introversion (I), Extroversion (E): a measure of whether a person prefers the inner world of ideas or the outer world of people and things. Myers (1980) wrote that "when circumstances permit, the introvert concentrates perception and judgment upon ideas, while the extrovert likes to focus them on the outside environment" (p. 7).
2. Intuition (N), Sensing (S): These are two kinds of perception. Intuitives will tend to see the possibilities of a situation and sensing types will notice all the immediate details.
3. Thinking (T), Feeling (F): These are two types of judgment. Thinking types prefer to judge a situation by examining data objectively. Feeling types will make decisions based on personal values and emotion.

4. Judgment (J), Perception (P): This category describes the way people prefer to deal with the world around themselves.

Judging types prefer to use thinking or feeling, and
perceptive types prefer to use intuition or sensing.

The MBTI produces two types of scores. The main scores are the four preference scores. Preference scores are made up of a letter showing the direction of a preference and a number showing consistency of a preference (such as E 19, N 33). The four letters for the four preferences combine to create 16 preference types, for example, INTP, ESTJ, ISFJ, and so on. Although type theory assumes dichotomies, Myers used a linear transformation of preference scores called continuous scores for correlational analysis. Continuous scores are computer generated by setting the midpoint at 100. If the letter portion of the preference score is E, S, T, or J, the numerical portion is subtracted from 100; if the letter portion is I, N, F, or P, the numerical portion is added to 100. Thus, a preference score of E 21 becomes 79 and a preference score of I 21 becomes 121.

The psychometric properties of the MBTI have been reviewed extensively and suggest that the instrument is appropriate for both applied and research usage. Based on empirical evidence that while the E-I, S-N, and T-F dimensions are independent, while the J-P and S-N functions are substantially related (Carlyn, 1977; Coan, 1978). Both test-retest and internal consistency reliability estimates of the MBTI tend to be in the .75 to .85 range (Carskadon, 1977; Myers, 1962). The consistently lowest reliability estimate is typically found on the T-F function (Myers, 1962), and, in general, the reliabilities of the continuous type

scores tend to be higher than those of the categorical type classification (Carlyn, 1977).

Idiosyncratic reliability on the four scales has been determined by the use of a "logically split-half procedure." Results of the adult sample are reported in Table 3-1.

These split-half reliabilities were derived from the "product-moment correlation between continuous scores for the X half on the Y half of each index, and thus take no account of the type dichotomies based on the scores" (Myers, 1960). (Phi correlation was not used because the type categories are an end product, and the input data of the indicator are not categorical.)

Table 3-1

Split-half Reliabilities of the Four Scales of the Myers-Briggs Type Indicator from the CAPT Data Bank

	<u>n</u>	E-I	S-N	T-F	J-P
Males	23,240	.82	.87	.84	.88
Females	32,731	.84	.86	.80	.87

(Myers & McCaulley, 1985, p. 166)

The construct validity of the MBTI has received the usual scrutiny in the literature. Initially some authors claimed the instruments did not measure the Jungian psychological typology (Mendelsohn, 1965; Stricker & Ross, 1964). More recent reviewers claim that the instrument is indeed an adequate representation of Jung's theoretical constructs

(Carlyn, 1977; Carskadon & Knudson, 1978; Coan, 1978; Steele & Kelly, 1976). In a comprehensive technical review of the MBTI Carlyn (1977) reported that the instrument exhibited moderate predictive validity in forecasting college major and academic achievement. In addition, the MBTI was found to be significantly related to the Gray-Wheelwright questionnaire (Gray & Wheelwright, 1946), an instrument developed by Jungian analysts to measure the same properties as the MBTI. In summary, the MBTI appears to be an acceptable empirical indicator of psychological type differences among late adolescents and adults.

The Millon Behavioral Health Inventory

The Millon Behavioral Health Inventory was used in this study to measure personality coping styles. According to Sweet et al. (1985), this instrument is particularly sensitive to psychopathology in medical populations; therefore, it was used instead of the Minnesota Multiphasic Personality Inventory because of its suitability for this study and its brevity. The instrument was developed specifically for use with physically ill patients with medical-behavioral decision-making issues required. The normative population of the MBHI consisted of several groups of nonclinical subjects ($n = 452$) and numerous samples of medical patients ($n = 2,113$) involved in diagnosis, treatment, or follow-up.

The MBHI contains 150 items that divide and overlap into eight scales to measure basic coping styles, six scales to measure psychogenic attitudes, and three scales to measure prognostic indices. The 20 scales and items are geared to an eighth-grade reading level. Potentially objectionable statements were screened. A brief description

of each scale can be found in Table 3-2, and comprehensive descriptions of the scales are found in Appendix A.

The author of the MBHI believes that validation is an on-going process that should take place in phases of test construction rather than assessing the accuracy of an instrument after its completion. The validation process has three separate procedures: theoretical-substantive, internal-structural, and external-criterion. A brief description of these procedures and results follows.

Theoretical-substantive validation stage: The MBHI is derived from Millon's theory of personality. This stage examines the degree to which the test items represent the theory. It consisted of constructing an item pool (1000 items), then reducing the list, and finally asking 10 health professionals familiar with the Millon personality theory to independently sort the items into Coping Style and Psychogenic Attitudes categories. In order for an item to be included, 7 of the 10 professionals had to have selected it.

Internal structure validation stage: This stage measured the within-scale homogeneity of the instrument. The author believes that coping style and psychogenic attitude are not discrete psychological dimensions and "comprise complex characteristics, sharing many traits as well as distinctive features" (Millon et al., 1982, p. 24). He stated that "factorial purity is neither clinically feasible, nor even theoretically preferred" (Millon et al., 1982, p. 24) and adapted procedures to enhance the high item-scale homogeneity.

Table 3-2

MBHI Scale Descriptions

Scales	Characteristic Behaviors of High Scorers
Basic Coping Styles:	
1. Introversive Styles (32 items)	emotionally flat, lacking in energy
2. Inhibited Style (43 items)	shy, easily hurt, keep their problems to themselves
3. Cooperative Style (33 items)	do not take initiative, but follow advice closely
4. Sociable Style (40 items)	outgoing, talkative, fickle, not too dependable
5. Confident Style (33 items)	calm and confident, usually follow treatment plans may expect special treatment
6. Forceful Style (33 items)	domineering, tough minded, may not follow treatment plans
7. Respectful Style (42 items)	responsible, conforming and cooperative, hold feelings inside
8. Sensitive Style (48 items)	unpredictable and moody, erratic in treatment plans
Psychogenic Attitude Scales:	
A) Chronic Tension (29 items)	disposed to suffer various psychosomatic and physical ills, constantly on the go, have trouble relaxing
B) Recent Stress (20 items)	susceptible to serious illness; higher incidence of poor physical and psychological health
C) Premorbid Pessimism (40 items)	view the world in a negative manner and tend to intensify their discomfort with real physical and psychological difficulties

Table 3-2. (Continued)

Scales	Characteristic Behaviors of High Scorers
Psychogenic Attitude Scales (Continued):	
D) Future Despair (38 items)	do not look forward to a productive future life and view medical difficulties as potentially life threatening
E) Social Alienation (33 items)	poor adjustment to hospitalization and low levels of family and social support
F) Somatic Anxiety (34 items)	hypochondriacal and susceptible to various minor illnesses; abnormal amount of fear concerning bodily functions
Psychosomatic Correlates Scales:	
MN) Allergic Inclination (34 items)	emotional factors are significant precipitants of disease processes
NN) Gastrointestinal Susceptibility (27 items)	react to psychological stress with increase of symptomatology
OO) Cardiovascular Tendency (38 items)	increase in complaint symptomatology under conditions of psychic tension
Prognostic Indices Scales:	
PP) Pain Treatment Responsivity (42 items)	psychological factors may maintain pain behaviors
QQ) Life Threat Reactivity (42 items)	typical among patients with comparable illnesses
RR) Emotional Vulnerability (12 items)	severe disorientation, depression or frank psychotic episodes

(Adapted from the test manual of the Millon Behavioral Health Inventory, 1982)

For development of the Coping Style Scale, Millon reduced the 1,000 items to 289. This version was administered to 2,500 subjects from a variety of settings. Point biserial correlations were calculated between each item and each personality scale. Only items that had a high correlation with the scale to which they were originally assigned were kept. Items with a correlation of $<.30$ were eliminated. The mean biserial correlation for all items for all personality scales was .47. This procedure reduced the Coping Style inventory to 64 items.

The Psychogenic Attitude scales were developed on theoretical substantive grounds. Thirty-five to 60 new items, based on previous research into the characteristics being measured, were developed for each of the six scales. These items were then rated by clinicians with experience in assessing the role of psychological influences upon physical illness. Only items selected by more than 75% of the raters were retained.

External Criterion Stage: This step consisted of empirically verified association of test items with a significant and relevant criterion measure. In this case, investigators administered preliminary items to two groups. The criterion group exhibited the trait with which the item was to be associated. The second or control group did not. Items that statistically differentiated the criterion group from the comparison group were judged "externally valid" (Millon et al., 1982, p. 24). Health professionals who knew the patients selected the criterion group patients. In addition to

the above procedure, investigators subjected each of the empirical scales developed for the MBHI to at least one cross-validated study (Millon et al., 1982, p.25).

Reliability of the MBHI was assessed with both test-retest and KR-20 procedures. Mean time elapsed between test and retest was 4.5 months. Table 3-3, from the test manual, gives the coefficients for both procedures. The coping style scales have a mean reliability of .82 and the psychogenic attitude scale has a mean of .85.

The Health History Questionnaire

One page of this survey is devoted to basic demographic data, health history, family history, and medication usage. The remainder consists of 135 questions covering various common health problems typically reviewed in a routine physical examination. Mitler Communications Inc. of Norwalk, Connecticut, developed this instrument. Statistical tests of reliability and validity would not be appropriate for this instrument.

The Health Locus of Control Scale

Wallston, Wallston, Kaplan, and Maides (1976) developed this instrument "to provide more sensitive predictors of the relationship between internality and health behaviors" (Wallston et. al., 1976, p. 581). Proponents of the locus of control construct believe that life experience leads to the development of expectancies that will influence behavior. The Rotter Locus of Control Scale was not appropriate for

Table 3-3

Estimate of Reliability for MBHI Scales

	Scale	Test-retest	KR-20
Coping Style	1. Introversive	.79	.72
	2. Inhibited	.84	.84
	3. Cooperative	.81	.68
	4. Sociable	.83	.82
	5. Confident	.86	.66
	6. Forceful	.77	.72
	7. Respectful	.78	.74
	8. Sensitive	.88	.86
Psychogenic Attitude	a. Chronic tension	.90	.77
	b. Recent stress	.87	.74
	c. Premorbid pessimism	.85	.90
	d. Future despair	.78	.86
	e. Social alienation	.85	.84
	f. Somatic anxiety	.79	.86
Psychosomatic Inclination	MN Allergic inclination	.83	.81
	NN Gastrointestinal susceptibility	.81	.83
	OO Cardiovascular tendency	.79	.85
Prognostic Index	PP Pain treatment responsivity	.82	.86
	QQ Life threat reactivity	.76	.83
	RR Emotional vulnerability	.59	.82

(Millon, Green & Meagher, 1982)

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measuring expectancies that might predict health behavior so a more idiosyncratic scale was necessary. In this study I used the Wallston Scale to control for locus of control.

The scale consists of 11 items chosen from a 34-item pool following appropriate statistical protocols. Alpha reliability of the 11-item scale is .72. In developing the scale, the authors controlled social desirability using the Marlow-Crowne Social Desirability Scale. The correlation was $-.01$. Test-retest reliability on the Wallston Health Locus of Control Scale was .91.

"Concurrent validity of the Health Locus of Control Scale (HLC) was evidenced by a .33 correlation ($p < .01$) with the Rotter I-E Scale for the original sample" (Wallston, Wallston, Kaplan, & Maides, 1976, p. 581). The authors reported two studies that suggest evidence of construct validity. They predicted and found that "internals" with high health values would seek more information about a given health situation and found it to be true. The second study was based on the belief that "internals would be more likely to take steps to better their environmental condition than externals" (p. 583). This was a weight-reduction program, and the results were as predicted. Internals lost more weight on a "self-directed program and externals lost more on a group program" (Wallston et al., 1976, p. 583).

In general, although the whole concept of locus of control is currently under study, I believe that the area-specific assessment instrument has met the criteria for inclusion in this study. Controlling for this variable in any study on health behavior seems important.

The McGill Pain Questionnaire

This instrument was designed to provide quantitative measures of clinical pain. It consists of three classes of descriptive words used to evaluate pain. The classes are sensory, affective, and evaluative. Research indicates that words in the sensory category are more frequently chosen, and all subjects tested chose words in the evaluative category. Investigators developed the instrument by asking subjects to classify 102 words into groups that describe different aspects of the pain experience. This effort yielded three categories. A fourth category, called miscellaneous, was added as patients suggested additional words.

The second part of the questionnaire development "was an attempt to determine the pain intensities implied by the words within each subclass" (Melzack, 1975, p. 278). Physicians and patients were asked to rate the words by intensity, and this resulted in a "high degree of agreement on the intensity relationships among pain descriptions by subjects who have different cultural, socio-economic and educational backgrounds" (p. 278). The test authors reported that four types of data can be ascertained from the questionnaire:

1. A pain rating index (PRI-S) based on mean scale score values.
2. A pain rating index (PRI-R) based on rank order values.
3. The number of words chosen (NWC).
4. The present pain intensity (PPI).

Initially the test authors did not report reliability per se and validity. However, they examined internal consistency of the instrument. They obtained correlations between mean scale values and

the rank order values and found them to be in the .91 to .94 range with a correlation of .95 for all four scales (see Table 3-4).

Table 3-4

Correlations of the Mean Scale Values and the Rank Order Values of the Pain Rating Index

Rank order values	Mean scale values				
	S	A	E	M	T
S	.94				
A		.92			
E			.93		
M				.91	
T					.95

The categories are S, sensory; A, affective; E, evaluative; M, miscellaneous; T, total, based on $n = 248$ (Melzack, 1975).

The number of words chosen total scale has four subscales: (a) the number of words chosen sensing (NWCS), (b) the number of words chosen affective (NWCA), (c) the number of words chosen evaluative (NWCE), and (d) the number of words chosen miscellaneous (NWCM). The pain rating index total scale also has four subscales: (a) the pain rating index sensory (PRIS), (b) the pain rating index affective (PRIA), (c) the pain rating index evaluative (PRIE), and (d) the pain rating index miscellaneous (PRIM).

Correlations between the number of words chosen (NWC) and the pain rating index (PRIT) was $r = .97$ for the scale (S) value and $r = .89$ for the rank order (R) value.

Correlations for present pain intensity (PPI) scales with the number of words chosen (NWCT) and the Pain Rating Index scales were significant ($p < .01$ in all cases) but very low (see Table 3-5). The author expressed the belief that these low correlations indicate that "a large part of the variance of the present pain intensity may be determined by factors other than those indicated by the descriptors" (Melzack, 1975, p. 285).

Table 3-5

Correlations Between the Present Pain Intensity Scale (PPI) and the Total Number of Words Chosen (NWCT)

	PPI
NWCT	.32
PRI-R Sensory	.29
PRI-R Affective	.42
PRI-R Evaluative	.49
PRI-R Miscellaneous	.18
PRI-R Total	.42

(Melzack, 1975)

Reading (1983a), in a recent review of the McGill Pain Questionnaire (MPQ), discussed the reliability and validity of the instrument. Reliability of this type of measure is affected by "the inherent fluctuating quality of the pain experience" (p. 56). He reports that repeated administrations of the questionnaire to cancer patients yielded a 75% consistency index (range 35-90%). In another study "the words selected on the MPQ have been compared with those chosen from a checklist format", and he obtained a broadly similar profile (p. 56).

Investigators examined construct validity by correlating McGill Pain Questionnaire scores with assessments of psychological state and found that "affective scores contributed to the prediction of MMPI profiles, with intensity emerging as the best predictor" (p. 57). The instrument is considered to have face validity because of the large number of clinical studies, using the MPQ as a dependent variable. Concurrent validity is demonstrated by the association of MPQ scores with analgesia requirements, verbal rating and visual analog rating scales, and ratings of headache intensity and duration. The distinctive score profiles of certain groups provide evidence of discriminant validity. As examples, Reading (1983b) reported that women in acute pelvic pain show greater use of sensory word groups in contrast to "chronic pain patients who use affective and evaluative groups with greater frequency" (p. 58).

Pain researchers have used the McGill Pain Questionnaire since its development in 1975. The high intercorrelations on the Pain Rating Index (PRI) and the Number of Words Chosen (NWC) Scale and its validity make it an acceptable instrument for quantitative evaluation of pain response.

Hypotheses Tested

1. Sensing types and Intuitive types will not score differently on the sensory category of the McGill Pain Questionnaire.
2. Feeling types and Thinking types will not score differently on the affective scale of the McGill Pain Questionnaire.

3. Judging types and Perceptive types will not score differently on the evaluative scale of the McGill Pain Questionnaire.
4. Sensing types and Intuitive types will not score differently on the intensity scale of the McGill Pain Questionnaire.
5. Sensing types and Intuitive types will not differ in the number of words they choose on the McGill Pain Questionnaire.
6. Sensing types and Intuitive types will not differ in the number of symptoms they report on the Health History Questionnaire.
7. Introverts and extroverts will not differ on the Health Locus of Control Scale.
8. Coping styles will not account for differences on the McGill Pain Questionnaire.

The .05 level of significance was used as the basis for rejecting a null hypothesis.

CHAPTER 4 RESULTS

Introduction

The purpose of the study was to examine the relationship between pain response and personality. I assessed personality type with the Myers-Briggs Type Indicator, coping styles with the Millon Behavioral Health Inventory, the Wallston Health Locus of Control Scale for measuring expectancies, and pain response with the McGill Pain Questionnaire. Data were collected from 55 surgical patients. The patients came from two surgical practices and made up three groups: (a) patients having a gastric bypass for morbid obesity (bypass group), (b) immediately postoperative hand surgical patients (hand surgery group), and (c) hand surgical patients 1 week or more postoperative who still had pain (rehab. group).

An analysis of variance was done on the three groups on the scales of the McGill Pain Questionnaire (MPQ) to determine if differences existed. Because I found significant differences on four of the MPQ scales, I treated this population as three groups. Table 4-1 contains results of the ANOVA, and Table 4-2 is a summary of the group means. Table 4-3 contains descriptive statistics of the three groups.

The Statistical Package for the Social Sciences (SPSS) version M, release 9.0, was the recommended computer program. Type distribution of the whole sample and of the three groups are in Tables 4-4, 4-5., 4-6,

Table 4-1

Analysis of Variance of the Whole Sample (n=55) and the Dependent Variable (Scores on the McGill Pain Questionnaire)

Scale	SS	df	MS	F
NWC T				
between groups	81.587	2	40.794	1.36
within groups	1549.795	52	29.804	
NWC S				
between groups	4.678	2	2.339	0.341
within groups	357.067	52	6.867	
NWC A				
between groups	10.164	2	5.082	1.725
within groups	153.182	52	2.946	
NWC E				
between groups	0.201	2	0.100	0.253
within groups	20.635	52	0.397	
NWC M				
between groups	29.937	2	14.969	1.681
within groups	463.045	52	8.905	
PRI T				
between groups	1224.504	2	612.252	3.613*
within groups	8810.878	52	169.440	
PRI S				
between groups	236.463	2	118.232	2.129
within groups	2888.264	52	55.544	
PRI A				
between groups	40.036	2	20.018	3.184*
within groups	326.946	52	6.287	
PRI E				
between groups	7.656	2	3.828	1.631
within groups	122.053	52	2.347	
PRI M				
between groups	125.974	2	62.987	5.851**
within groups	559.772	52	10.765	
PPI				
between groups	23.883	2	11.941	5.786**
within groups	107.317	52	2.064	

* $p < .05$. ** $p < .01$.

Table 4-2

Means by Group for McGill Pain Questionnaire Scales

	Gastric Bypass		Hand Surgery		Hand Rehab.	
	Mean	SD	Mean	SD	Mean	SD
NWC T	10.84	5.2	12.33	6.6	13.90	4.5
NWC S	6.53	2.5	6.58	3.2	7.27	2.0
NWC A	1.75	1.6	2.50	1.8	2.72	1.7
NWC E	0.96	0.7	0.83	0.3	1.0	0.0
NWC M	2.21	3.5	2.33	1.5	4.09	2.3
PRI T	21.46	11.9	28.00	16.5	33.09	11.6
PRI S	13.90	7.0	17.50	9.7	18.63	5.5
PRI A	2.34	2.2	3.50	2.9	4.45	2.8
PRI E	1.87	1.5	1.91	1.5	2.81	1.3
PRI M	3.34	2.8	5.08	3.9	7.18	3.5
PPI	0.84	1.6	2.08	1.6	2.27	1.8

Table 4-3

Description of Sample by Group, Gender, Mean Age

Groups	<u>n</u>	<u>\bar{x}</u> age	Female	Male
Group (a)--Gastric Bypass Patients	32	37	27	5
Group (b)--Hand Surgical Patients	12	47	7	5
Group (c)--Hand Rehab. Patients	11	43	7	4

Table 4-4

Type Distribution of Total Sample

N = 55

SINCE		INTUITION	
THINKING	FEELING	FEELING	THINKING
ISTJ N= 6 %= 10.91 ■■■■■■■■ ■	ISFJ N= 6 %= 10.91 ■■■■■■■■ ■	INFJ N= 0 %= 0.00 ■■■■■■■■ ■	INTJ N= 2 %= 3.64 ■■■■■■■■ ■
ISTP N= 1 %= 1.82 ■■■■■■■■ ■	ISFP N= 8 %= 14.55 ■■■■■■■■ ■■■■■■■■	INFP N= 3 %= 5.45 ■■■■■■■■ ■■■■■■■■	INTP N= 0 %= 0.00 ■■■■■■■■ ■
ESTP N= 6 %= 10.91 ■■■■■■■■ ■	ESFP N= 4 %= 7.27 ■■■■■■■■ ■■■■■■■■	ENFP N= 4 %= 7.27 ■■■■■■■■ ■■■■■■■■	ENTP N= 0 %= 0.00 ■■■■■■■■ ■
ESTJ N= 4 %= 7.27 ■■■■■■■■ ■■■■■■■■	ESFJ N= 9 %= 16.36 ■■■■■■■■ ■■■■■■■■	ENFJ N= 1 %= 1.82 ■■■■■■■■ ■■■■■■■■	ENTJ N= 1 %= 1.82 ■■■■■■■■ ■■■■■■■■

Note: ■ = 1% of sample

	N	%
INTROVERSION		
E	29	52.73
I	26	47.27
PERCEPTION		
S	44	80.00
N	11	20.00
T	20	36.36
F	35	63.64
J	29	52.73
P	26	47.27
EXTRAVERSION		
IJ	14	25.45
IP	12	21.82
EP	14	25.45
EJ	15	27.27
ST	17	30.91
SF	27	49.09
NF	8	14.55
NT	3	5.45
SJ	25	45.45
SP	19	34.55
NP	7	12.73
NJ	4	7.27
FUNCTION		
TJ	13	23.64
TP	7	12.73
FP	19	34.55
FJ	16	29.09
MODALITY		
IN	5	9.09
EN	6	10.91
IS	21	38.18
ES	23	41.82
ATTITUDE		
ET	11	20.00
EF	18	32.73
IF	17	30.91
IT	9*	16.36
DOMINANCE		
S dom	22	40.00
N dom	6	10.91
T dom	6	10.91
F dom	21	38.18

Table 4-5

Type Distribution of the Gastric Bypass Group

N = 32

SENSING		INTUITION	
THINKING	FEELING	FEELING	THINKING
ISTJ N= 1 %= 3.12 ■■■	ISFJ N= 3 %= 9.38 ■■■■■■■■	INFJ N= 0 %= 0.00	INTJ N= 2 %= 6.25 ■■■■■
ISTP N= 1 %= 3.12 ■■■	ISFP N= 4 %= 12.50 ■■■■■■■■ ■■■	INFP N= 3 %= 9.38 ■■■■■■■■	INTP N= 0 %= 0.00
ESTP N= 4 %= 12.50 ■■■■■■■■ ■■■	ESFP N= 3 %= 9.38 ■■■■■■■■	ENFP N= 3 %= 9.38 ■■■■■■■■	ENTP N= 0 %= 0.00
ESTJ N= 2 %= 6.25 ■■■■■■	ESFJ N= 5 %= 15.62 ■■■■■■■■ ■■■■■	ENFJ N= 1 %= 3.12 ■■■	ENTJ N= 0 %= 0.00

Note: ■ = 1% of sample

	N	%
E	18	56.25
I	14	43.75
S	23	71.87
N	9	28.13
T	10	31.25
F	22	68.75
J	14	43.75
P	18	56.25
IJ	6	18.75
IP	8	25.00
EP	10	31.25
EJ	8	25.00
ST	8	25.00
SF	15	46.87
NF	7	21.88
NT	2	6.25
SJ	11	34.38
SP	12	37.50
NP	6	18.75
NJ	3	9.38
TJ	5	15.62
TP	5	15.62
FP	13	40.62
FJ	9	28.13
IN	5	15.62
EN	4	12.50
IS	9	28.13
ES	14	43.75
ET	6	18.75
EF	12	37.50
IF	10	31.25
IT	4	12.50
S dom	11	34.38
N dom	5	15.62
T dom	3	9.38
F dom	13	40.62

Table 4-6

Type Distribution of the Hand Surgical Group

N = 12					
SENSING		INTUITION			
THINKING	FEELING	FEELING	THINKING		
ISTJ		ISFJ		INFJ	
N= 2 %= 16.67		N= 2 %= 16.67		N= 0 %= 0.00	
■■■■■■■■■■		■■■■■■■■■■			
■■■■■■■■■■		■■■■■■■■■■			
ISTP		ISFP		INFP	
N= 0 %= 0.00		N= 3 %= 25.00		N= 0 %= 0.00	
		■■■■■■■■■■			
		■■■■■■■■■■			
		■■■■■■■■■■			
ESTP		ESFP		ENFP	
N= 1 %= 8.33		N= 0 %= 0.00		N= 0 %= 0.00	
■■■■■■■■■■					
■■■■■■■■■■					
■■■■■■■■■■					
ESTJ		ESFJ		ENFJ	
N= 1 %= 8.33		N= 3 %= 25.00		N= 0 %= 0.00	
■■■■■■■■■■		■■■■■■■■■■			
■■■■■■■■■■		■■■■■■■■■■			
■■■■■■■■■■		■■■■■■■■■■			
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Note: ■ = 1% of sample

and 4-7. Scales of the independent and dependent variables are summarized in Figure 4-1.

Correlations

With the Pearson product moment correlation I examined the relationship between the scales of the Myers-Briggs Indicator, the coping style scales of the Millon Behavioral Health Inventory, and the scales of the McGill Pain Questionnaire. Results of these correlations are in Appendix D. The Sensing-Intuitive scale of the Myers-Briggs was significantly related to the miscellaneous category of the McGill Pain Questionnaire ($r = .33$, $p < 0.05$). None of the other scales of the MBTI had a significant relationship with the McGill; in fact, the correlations were low.

On the Millon scales, significant relationships appeared between the Present Pain Intensity and the Introversive scale ($r = 0.52$, $p < .001$), the Cooperative scale ($r = 0.32$, $p < .05$), and the Sensitive scale ($r = -0.47$, $p < .01$).

Hypothesis Testing

I tested the hypotheses of the bipolar scales of the Myers-Briggs Type Indicator (Ho 1 through Ho 7) using a t test for independent samples with the bypass group and a one-way ANOVA with both hand groups. These procedures were used for ease in computation. For statistical analysis, I used the continuous scores of the MBTI bipolar groups, choosing a significance level of .05.

The Selection Ratio Type Table (SRTT) analysis is a ratio of the observed to expected frequency based on the proportion of the type in

Table 4-7

Type Distribution of the Hand Rehabilitation Group

N = 11						
THINKING		SENSING	FEELING	FEELING	INTUITION	THINKING
ISTJ		ISFJ		INFJ		INTJ
N= 3		N= 1		N= 0		N= 0
% = 27.27		% = 9.09		% = 0.00		% = 0.00
■■■■■■■■■		■■■■■■■■■				
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ISTP		ISFP		INFP		INTP
N= 0		N= 1		N= 0		N= 0
% = 0.00		% = 9.09		% = 0.00		% = 0.00
		■■■■■■■■■				
ESTP		ESFP		ENFP		ENTP
N= 1		N= 1		N= 1		N= 0
% = 9.09		% = 9.09		% = 9.09		% = 0.00
■■■■■■■■■		■■■■■■■■■		■■■■■■■■■		
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ESTJ		ESFJ		ENFJ		ENTJ
N= 1		N= 1		N= 0		N= 1
% = 9.09		% = 9.09		% = 0.00		% = 9.09
■■■■■■■■■		■■■■■■■■■				■■■■■■■■■

	N	%
E	6	54.55
I	5	45.45
S	9	81.82
N	2	18.18
T	6	54.55
F	5	45.45
J	7	63.64
P	4	36.36
I J	4	36.36
I P	1	9.09
EP	3	27.27
E J	3	27.27
ST	5	45.45
SF	4	36.36
NF	1	9.09
NT	1	9.09
S J	6	54.55
S P	3	27.27
NP	1	9.09
N J	1	9.09
T J	5	45.45
TP	1	9.09
FP	3	27.27
F J	2	18.18
I N	0	0.00
EN	2	18.18
I S	5	45.45
ES	4	36.36
ET	3	27.27
EF	3	27.27
I F	2	18.18
I T	3	27.27
S dom	6	54.55
N dom	1	9.09
T dom	2	18.18
F dom	2	18.18

	<u>Scale</u>	<u>Acronym</u>
Myers-Briggs Type Indicator	Extraversion-Introversion	EI
	Sensing-Intuition	SN
	Thinking-Feeling	TF
	Judgment-Perception	JP
Millon Behavioral Health Inventory	Introversive Style	Scale 1
	Inhibited Style	Scale 2
	Cooperative Style	Scale 3
	Sociable Style	Scale 4
	Confident Style	Scale 5
	Forceful Style	Scale 6
	Respectful Style	Scale 7
	Sensitive Style	Scale 8
Health Locus of Control		HLC
McGill Pain Questionnaire	Number of words chosen total	NWCT
	Number of words chosen sensing	NWCS
	Number of words chosen affective	NWCA
	Number of words chosen evaluative	NWCE
	Number of words chosen miscellaneous	NWCM
	Pain Rating Index Total	PRI T
	Pain Rating Index Sensing	PRI S
	Pain Rating Index Affective	PRI A
	Pain Rating Index Evaluative	PRI E
	Pain Rating Index Miscellaneous	PRI M
	Present Pain Intensity	PPI

Figure 4-1. Summary of scales and acronyms used in this study.

the total sample. In this case because of the small \underline{n} , I compared the groups above and below the median individually to the whole sample. When the SRTT index is 1.00, the observed frequency in the sample tested is what would be expected based on the whole population. When the index or ratio is greater than 1.00, the cell contains more people than one would expect from the numbers in the base population (McCaulley, 1985, p. 50). The SRTT is based on the chi square statistic, or Fisher's exact probability if the \underline{n} is small, to determine if the overrepresentation or underrepresentation is significant.

Hypothesis testing of the Millon Behavioral Health Inventory coping style scales was by analysis of variance using base rate scores, with a significance level of .05. The computer-generated base rate scores, described in the test manual, represent a conversion of the raw scores predicated on estimated style or class prevalence data. A base rate score of 75 or above is indicative of the presence of the coping style.

The dependent variable for hypotheses numbers 1, 2, 3, 4, 5, and 8 was the selected scales of the McGill Pain Questionnaire (MPQ). These scales contain three basic types of measurement. First is the number of words chosen total scale (NWCT) which is further broken down to the number of words chosen sensory (NWCS), the number of words chosen affective (NWCA), the number of words chosen evaluative (NWCE), and the number of words chosen miscellaneous (NWCM). Second is the pain rating index total (PRIT) scale, which is broken down to the pain rating index sensory (PRIS), the pain rating index affective (PRIA), the pain rating index evaluative (PRIE), and the pain rating index miscellaneous (PRIM). The words are rank ordered within the groups, and this score is obtained

by adding the values within each group. Third is the present pain intensity scale (PPI), a measure of the patient's pain at the moment the instrument is administered.

The dependent variable for hypothesis number 6 was the total number of symptoms checked on the Health History Questionnaire (HHQ). Table 4-8 contains the means and standard deviations of the three groups on this variable.

Table 4-8

Means and Standard Deviations of the Three Groups on the Total Number of Symptoms

Group	Mean	SD
Bypass group	30.87	13.79
Hand surgery group	27.08	14.15
Hand rehab. group	29.00	20.16

The dependent variable for hypothesis 7 was the score on the Health Locus of Control Scale (HLC). A score of 33.0 or above indicates externality and 32.9 or below indicates internality. Table 4-9 contains the HLC means for the three groups.

Table 4-9

Means and Standard Deviations of the Three Groups on the Health Locus of Control Scale

Group	Mean	SD
Bypass group	33.46	8.38
Hand surgery group	34.66	12.87
Hand rehab. group	40.27	5.14

Results of Hypothesis Testing

Ho 1: Sensing types and intuitive types will not score differently on the sensory categories of the McGill Pain Questionnaire.

Sensing and intuitive types did not differ in the sensory categories of the McGill Pain Questionnaire in either group. Therefore, the null hypothesis that sensing types and intuitive types will not score differently is not rejected.

The t test for differences between the bipolar scales of the MBTI and the sensory categories of the MPQ for the bypass group are in Tables 4-10 and 4-11. The analysis of variance of the bipolar scales of the MBTI on the sensory scales of the McGill Pain Questionnaire (MPQ) for the hand surgery group are in Tables 4-12 and 4-13 and 4-14 and 4-15 for the hand rehab. group.

The selection ratio type table analysis (SRTT) did not show significant overrepresentation or underrepresentation between sensing and intuitive types on the Number of Words Chosen Sensory Scale (NWCS) (Tables 4-16 and 4-17) and the Pain Rating Index Sensory Scale (PRIS) (Tables 4-18 and 4-19). The complete SRTTs are in Appendix E.

Table 4-10

t Test for Differences Between Bipolar Scales of the MBTI on the NWCS (Bypass Group)

Scale	<u>n</u>	%	Mean	SD	t
E	18	56.25	7.05	2.0	1.818
I	14	43.75	5.85	2.9	
S	23	71.88	6.56	2.5	0.014
N	9	28.13	6.44	2.7	
T	10	31.25	5.90	2.8	0.905
F	22	68.75	6.81	2.3	
J	14	43.75	5.78	2.6	2.254*
P	18	56.25	7.11	2.3	

* $p < .05$.

Table 4-11

t Test for Differences Between Bipolar Scales of the MBTI on the PRIS (Bypass Group)

Scale	<u>n</u>	%	Mean	SD	t
E	18	56.25	14.55	6.6	0.343
I	14	43.75	13.07	7.6	
S	23	71.88	13.65	6.9	0.104
N	9	28.13	14.55	7.6	
T	10	31.25	13.00	7.2	0.236
F	22	68.75	14.31	7.0	
J	14	43.75	13.07	7.6	0.343
P	18	56.25	14.55	6.6	

Table 4-12

Analysis of Variance of the Bipolar Scales of the MBTI on the NWCS of the McGill Pain Questionnaire (MPQ) (Hand Surgery Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	5	7.60	3.78	57.20	0.820
I	7	5.85	2.91	50.85	
S	12	6.58	3.26	116.91	--
N	0	--	--	--	
T	4	7.00	2.16	14.00	0.090
F	8	6.37	3.81	101.87	
J	8	7.37	3.29	75.87	1.476
P	4	5.00	2.94	26.00	

Table 4-13

Analysis of Variance of the Bipolar Scales of the MBTI on the PRIS Scale of the McGill Pain Questionnaire (Hand Surgery Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	5	22.80	10.8	470.80	3.001
I	7	13.71	7.4	331.42	
S	12	17.5	9.7	1043.00	--
N	--	--	--	--	
T	4	19.00	8.7	232.00	0.131
F	8	16.75	10.6	797.50	
J	8	19.25	9.1	583.50	0.758
P	4	14.00	11.3	386.00	

Table 4-14

Analysis of Variance of the Bipolar Scales of the MBTI on the NWCS (Hand Rehab. Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	6	7.50	2.07	21.50	0.148
I	5	7.00	2.23	20.00	
S	9	7.44	2.24	40.22	0.323
N	2	6.50	0.70	0.50	
T	6	6.66	1.96	19.33	1.169
F	5	8.00	2.12	18.00	
J	7	7.28	2.21	29.42	0.001
P	4	7.25	2.06	12.75	

Table 4-15

Analysis of Variance of the Bipolar Scales of the MBTI on the PRIS (Rehab. Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	6	18.66	4.32	93.33	0.000
I	5	18.60	7.40	219.20	
S	9	19.66	5.50	242.00	1.819
N	2	14.00	4.24	260.00	
T	6	16.66	5.12	131.33	1.764
F	5	21.00	5.70	130.00	
J	7	16.42	4.15	103.71	3.861
P	4	22.50	6.19	115.00	

Table 4-16

SRTT Analysis: Below the Median on Number of Words Chosen (Sensory) on the McGill Pain Questionnaire (n=24)

Scale	<u>n</u>	%	I
E	9	37.50	.71*
I	15	62.50	1.32*
S	18	75.00	.94
N	6	25.00	1.25
T	9	37.50	1.03
F	15	62.50	.98
J	13	54.17	1.03
P	11	45.83	.97

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

*p < .05.

Table 4-17

SRTT Analysis: Above the Median on Number of Words Chosen (Sensory) on the McGill Pain Questionnaire (n=31)

Scale	<u>n</u>	%	I
E	20	64.52	1.22*
I	11	35.48	.75*
S	26	83.87	1.05
N	5	16.13	.81
T	11	35.48	.98
F	20	64.52	1.01
J	16	51.61	.98
P	15	48.39	1.02

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

*p < .05.

Table 4-18

SRTT Analysis: Below the Median on the Pain Rating Index (Sensory) of the McGill Pain Questionnaire (n=27)

Scale	<u>n</u>	%	I
E	13	48.15	.91
I	14	51.85	1.10
S	20	74.07	.93
N	7	25.93	1.30
T	10	37.04	1.02
F	17	62.96	.99
J	15	55.56	1.05
P	12	44.44	.94

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Table 4-19

SRTT Analysis: Above the Median on the Pain Rating Index (Sensory) of the McGill Pain Questionnaire (n=28)

Scale	<u>n</u>	%	I
E	16	57.14	1.08
I	12	42.86	.91
S	24	85.71	1.07
N	4	14.29	.71
T	10	35.71	.98
F	18	64.29	1.01
J	14	50.00	.95
P	14	50.00	1.06

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Ho 2: Feeling types and thinking types will not score differently on the affective scale of the McGill Pain Questionnaire.

In the gastric bypass group feeling types did not choose more affective words than thinking types on the Number of Words Chosen Affective (NWCA) scale of the McGill Pain Questionnaire. Feeling types did choose significantly ($p < .05$) more affective words than thinking types on the Pain Rating Index Affective (PRIA) scale of the McGill Pain Questionnaire (Tables 4-20 and 4-21). Therefore, the null hypothesis that feeling types would not differ from thinking types on the affective scale of the McGill Pain Questionnaire is rejected for the gastric bypass group.

In the hand surgery group (Tables 4-22 and 4-23) and the hand rehab. group (Tables 4-24 and 4-25) there were no significant differences between feeling types and thinking types on the affective scales of the McGill Pain Questionnaire.

In the SRTT analysis (Tables 4-26, 4-27, 4-28, and 4-29) no significant overrepresentations or underrepresentations were present between feeling types and thinking types on the affective scales of the McGill Pain Questionnaire. The complete SRTTs are in Appendix E.

Table 4-20

t Test for Differences Between Bipolar Scales of the MBTI on the NWCA (Bypass Group)

Scale	<u>n</u>	%	Mean	SD	t
E	18	56.25	1.72	1.4	0.012
I	14	43.75	1.78	1.8	
S	23	71.88	1.69	1.7	0.089
N	9	28.13	1.88	1.3	
T	10	31.25	1.30	2.0	1.118
F	22	68.75	1.95	1.4	
J	14	43.75	1.35	1.5	1.474
P	18	56.25	2.05	1.6	

Table 4-21

t Test for Differences Between Bipolar Scales of the MBTI on the PRIA (Bypass Group)

Scale	<u>n</u>	%	Mean	SD	t
E	18	56.25	2.22	1.8	0.119
I	14	43.75	2.50	2.6	
S	23	71.88	2.13	2.2	0.747
N	9	28.13	2.88	2.1	
T	10	31.25	1.50	2.2	2.174*
F	22	68.75	2.72	2.1	
J	14	43.75	1.78	2.2	1.598
P	18	56.25	2.77	2.1	

*p < .05.

Table 4-22

Analysis of Variance of the Bipolar Scales of the MBTI on the NWCA of the McGill (Hand Surgery Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	5	3.00	1.87	14.00	0.581
I	7	2.14	1.95	22.85	
S	12	2.5	1.88	39.00	--
N	0	--	--	--	
T	4	2.75	1.89	10.75	0.097
F	8	2.37	1.99	27.87	
J	8	2.87	1.95	26.87	0.947
P	4	1.75	1.70	8.75	

Table 4-23

Analysis of Variance of the Bipolar Scales of the MBTI on the PRIA (Hand Surgery Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	5	4.60	2.79	31.20	1.255
I	7	2.71	2.92	51.42	
S	12	3.50	2.90	93.00	--
N	0	--	--	--	
T	4	4.50	3.10	29.00	0.690
F	8	3.00	2.87	58.00	
J	8	4.00	2.87	58.00	0.690
P	4	2.50	3.10	29.00	

Table 4-24

Analysis of Variance of the Bipolar Scales of the MBTI on the NWCA Scale of the MPQ (Hand Rehab. Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	6	3.16	1.47	10.83	0.774
I	5	2.20	2.16	18.80	
S	9	3.00	1.87	28.00	1.163
N	2	1.50	0.70	0.50	
T	6	2.33	1.96	19.33	0.612
F	5	3.20	1.64	10.80	
J	7	2.28	1.97	23.42	1.188
P	4	3.50	1.29	5.00	

Table 4-25

Analysis of Variance of the Bipolar Scales of the MBTI on the PRIA Scale of the MPQ (Hand Rehab. Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	6	5.16	2.48	30.83	0.814
I	5	3.60	3.28	43.20	
S	9	4.77	2.90	67.55	0.616
N	2	3.00	2.82	8.00	
T	6	3.50	3.08	41.50	1.576
F	5	5.60	2.30	21.20	
J	7	3.57	3.04	55.71	2.056
P	4	6.00	1.82	10.00	

Table 4-26

SRTT Analysis: Below the Median on the Number of Words (Affective) NWCA Scale of the McGill Pain Questionnaire (n=27)

Scale	<u>n</u>	%	I
E	12	44.44	.84
I	15	55.56	1.18
S	21	77.78	.97
N	6	22.22	1.11
T	12	44.44	1.22
F	15	55.56	.87
J	16	59.26	1.12
P	11	40.74	.86

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Table 4-27

SRTT Analysis: Above the Median on the Number of Words (Affective) NWCA Scale of the McGill Pain Questionnaire (n=28)

Scale	<u>n</u>	%	I
E	17	60.71	1.15
I	11	39.29	.83
S	23	82.14	1.03
N	5	17.86	.89
T	8	28.57	.79
F	20	71.43	1.12
J	13	46.43	.88
P	15	53.57	1.13

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Table 4-28

SRTT Analysis: Below the Median on the Pain Rating Index (Affective)
PRIA of the McGill Pain Questionnaire (n=28)

Scale	<u>n</u>	%	I
E	12	42.86	.81
I	16	57.14	1.21
S	22	78.57	.48
N	6	21.43	1.07
T	12	42.86	1.18
F	16	57.14	.90
J	16	57.14	1.08
P	12	42.86	.91

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Table 4-29

SRTT Analysis: Above the Median on the Pain Rating Index (Affective)
PRIA of the McGill Pain Questionnaire (n=27)

Scale	<u>n</u>	%	I
E	17	62.96	1.19
I	10	37.04	.78
S	22	81.48	1.02
N	5	18.52	.93
T	8	29.63	.81
F	19	70.37	1.11
J	13	48.15	.91
P	17	51.85	1.10

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Ho 3: Judging types and perceptive types will not score differently on the evaluative scale of the McGill Pain Questionnaire.

Judging types and perceptive types from the three groups did not score differently on the evaluative scale of the McGill Pain Questionnaire. Therefore, the null hypothesis is not rejected.

The means, standard deviations, and t values for the bypass group are summarized in Tables 4-30 and 4-31. Tables 4-32 and 4-33 are summaries of the ANOVAs for the hand surgery group, and Tables 4-34 and 4-35 are the ANOVAs for the hand rehab. group.

The SRTT analyses showed no significant overrepresentations or underrepresentations in the judging-perception dimension on the evaluative scales of the McGill Pain Questionnaire. Summaries of the SRTT are found in Tables 4-36, 4-37, 4-38, and 4-39. The complete SRTTs are in Appendix E.

Table 4-30

t Test for Differences Between Bipolar Scales of the MBTI on the NWCE (Bypass Group)

Scale	<u>n</u>	%	Mean	SD	t
E	18	56.25	1.05	0.9	0.498
I	14	43.75	0.85	0.3	
S	23	71.88	0.82	0.6	2.886**
N	9	28.13	1.33	1.0	
T	10	31.25	0.70	0.4	1.759
F	22	68.75	1.09	0.8	
J	14	43.75	0.85	0.7	0.498
P	18	56.25	1.05	0.8	

* $p < .05$. ** $p < .01$.

Table 4-31

t Test for Differences Between Bipolar Scales of the MBTI and the PRIE (Bypass Group)

Scale	<u>n</u>	%	Mean	SD	t
E	18	56.25	1.66	1.6	0.708
I	14	43.75	2.14	1.5	
S	23	71.88	1.69	1.6	1.054
N	9	28.13	2.33	1.4	
T	10	31.25	1.60	1.5	0.432
F	22	68.75	2.00	1.6	
J	14	43.75	1.78	1.8	0.077
P	18	56.25	1.94	1.4	

Table 4-32

Analysis of Variance of the Bipolar Scales of the MBTI on the NWCE Scales of the MPQ (Hand Surgery Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	5	0.80	0.44	0.80	0.057
I	7	0.85	0.37	0.85	
S	12	0.83	0.38	1.66	--
N	--	--	--	--	
T	4	0.75	0.50	0.75	0.256
F	8	0.87	0.35	0.87	
J	8	0.75	0.46	1.50	1.111
P	4	1.00	0.0	0.0	

Table 4-33

Analysis of Variance of the Bipolar Scales of the MBTI on the PRIE Scale of the MPQ (Hand Surgery Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	5	2.20	1.92	14.80	0.262
I	7	1.17	1.38	11.42	
S	12	1.91	1.56	26.91	--
N	--	--	--	--	
T	4	2.25	2.21	14.75	0.254
F	8	1.75	1.28	11.50	
J	8	1.50	1.41	14.00	1.832
P	4	2.75	1.70	8.75	

Table 4-34

Analysis of Variance of the Bipolar Scales of the MBTI on the PRIE Scale of the MPQ (Hand Rehab. Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	6	2.83	1.60	12.83	0.002
I	5	2.80	1.09	4.80	
S	9	2.88	1.26	12.88	0.128
N	2	2.50	2.12	4.50	
T	6	2.00	1.09	6.00	9.037**
F	5	3.80	0.83	2.80	
J	7	2.57	1.13	7.71	0.641
P	4	3.25	1.70	8.75	

* $p < .05$. ** $p < .01$.

Table 4-35

Analysis of Variance of the Bipolar Scales of the MBTI on the NWCE Scale of the MPQ (Hand Rehab. Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	6	1.00	0.0	0.0	--
I	5	1.00	0.0	0.0	
S	9	1.00	0.0	0.0	--
N	2	1.00	0.0	0.0	
T	6	1.00	0.0	0.0	--
F	5	1.00	0.0	0.0	
J	7	1.00	0.0	0.0	--
P	4	1.00	0.0	0.0	

Table 4-36

SRTT Analysis: Below the Median on the Number of Words Chosen
(Evaluative) NWCE Scale of the McGill Pain Questionnaire (n=8)

Scale	<u>n</u>	%	I
E	5	62.50	1.19
I	3	37.50	.79
S	8	--	1.25
N	0	0.00	0.00
T	4	50.00	1.38
F	4	50.00	.29
J	6	75.00	1.42
P	2	25.00	.53

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Table 4-37

SRTT Analysis: Above the Median on the Number of Words Chosen
(Evaluative) NWCE Scale of the McGill Pain Questionnaire (n=47)

Scale	<u>n</u>	%	I
E	24	51.06	.97
I	23	48.94	1.04
S	36	76.60	.96
N	11	23.40	1.17
T	16	34.04	.94
F	31	65.96	1.04
J	23	48.94	.93
P	24	51.06	1.08

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Table 4-38

SRTT Analysis: Below the Median on the Pain Rating Index (Evaluative)
PRIE Scale of the McGill Pain Questionnaire (n=27)

Scale	<u>n</u>	%	I
E	15	55.56	1.05
I	12	44.44	.94
S	22	81.48	1.02
N	5	18.52	.93
T	11	40.74	1.12
F	16	59.26	.93
J	15	55.56	1.05
P	12	44.44	.94

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Table 4-39

SRTT Analysis: Above the Median on the Pain Rating Index (Evaluative)
PRIE Scale of the McGill Pain Questionnaire (n=28)

Scale	<u>n</u>	%	I
E	14	50.00	.95
I	14	50.00	1.06
S	22	78.57	.98
N	6	21.43	1.07
T	9	32.14	.88
F	19	67.87	1.07
J	14	50.00	.95
P	14	50.00	1.06

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Ho 4: Sensing types and intuitive types will not score differently on the intensity scale (PRIT) of the McGill Pain Questionnaire.

Sensing types and intuitive types did not score differently on the intensity scale (PRIT) of the McGill Pain Questionnaire. Therefore, the null hypothesis is not rejected.

A summary of the means and standard deviations for the gastric bypass group is in Table 4-40. The ANOVAs for the hand surgery group and the hand rehab group are in Tables 4-41 and 4-42.

The SRTT analysis did not show significant overrepresentation or underrepresentation in the sensing-intuitive dimension on the PRIT of the McGill Pain Questionnaire. Summaries of the SRTT are in Tables 4-43 and 4-44. The complete SRTT is in Appendix E.

Table 4-40

t Test for Differences Between the Bipolar Scales of the MBTI on the PRIT (Gastric Bypass Group)

Scale	<u>n</u>	%	Mean	SD	<u>t</u>
E	18	56.25	21.55	10.5	0.002
I	14	43.75	21.35	14.0	
S	23	71.88	20.82	11.9	0.229
N	9	28.13	23.11	12.5	
T	10	31.25	18.60	12.2	0.828
F	22	68.75	22.77	11.9	
J	14	43.75	19.42	13.1	0.714
P	18	56.25	23.05	11.1	

Table 4-41

Analysis of Variance of the Bipolar Scales of the MBTI on the PRIT Scale of the MPQ (Hand Surgery Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	5	36.60	18.95	1437.20	2.682
I	7	21.85	12.42	926.85	
S	12	28.00	16.50	2998.00	--
N	--	--	--	--	
T	4	30.25	16.99	866.75	0.102
F	8	26.87	17.32	2100.87	
J	8	29.87	16.59	1928.87	0.290
P	4	24.25	18.11	984.75	

Table 4-42

Analysis of Variance of the Bipolar Scales of the MBTI on the PRIT Scale of the MPQ (Hand Rehab. Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	6	34.00	9.27	430.00	0.073
I	5	32.00	15.11	914.00	
S	9	35.22	11.43	1045.55	1.791
N	2	23.50	9.19	84.50	
T	6	28.33	11.82	699.33	2.546
F	5	38.80	9.44	356.80	
J	7	29.00	11.01	728.00	2.807
P	4	40.25	10.07	304.75	

* $p < .05$.

Table 4-43

SRTT Analysis: Below the Median on the Pain Rating Index (Total) PRIT Scale of the McGill Pain Questionnaire (n=29)

Scale	<u>n</u>	%	I
E	13	44.83	.85
I	16	55.17	1.17
S	23	79.31	.99
N	6	20.69	1.03
T	10	34.48	.95
F	19	65.62	1.03
J	15	51.72	.98
P	14	48.28	1.02

% = Percent of total choosing this group who fall into this type
 I = Self-selection index; ratio of percent of type in group to % in sample

Table 4-44

SRTT Analysis: Above the Median on the Pain Rating Index (Total) PRIT Scale of the McGill Pain Questionnaire (n=26)

Scale	<u>n</u>	%	I
E	16	61.54	1.17
I	10	38.46	.81
S	21	80.77	1.01
N	5	19.23	.96
T	10	38.46	1.06
F	16	61.54	.97
J	14	53.85	1.02
P	12	46.15	.98

% = Percent of total choosing this group who fall into this type
 I = Self-selection index; ratio of percent of type in group to % in sample

Ho 5: Sensing types and intuitive types will not differ in the number of words they chose on the McGill Pain Questionnaire.

Sensing types and intuitive types did not differ in the number of words they chose on the McGill Pain Questionnaire in any of the groups. Therefore, the null hypothesis is not rejected.

A summary of means and standard deviations for the bypass group on the number of words chosen is in Table 4-45. The ANOVAs for the hand surgery group and the hand rehab. group on the number of words chosen are in Tables 4-46 and 4-47.

The SRTT analysis did not show significant overrepresentation or underrepresentation of sensing or intuitive types on the number of words chosen. Summaries of the SRTTs are in Tables 4-48 and 4-49. The complete SRTT is in Appendix E.

Table 4-45

t Test for Differences Between the Bipolar Scales of the MBTI on the NWCT (Bypass Group)

Scale	<u>n</u>	%	Mean	SD	<u>t</u>
E	18	56.25	11.33	4.7	0.347
I	14	43.75	10.21	6.0	
S	23	71.88	10.91	5.5	0.014
N	9	28.13	10.66	4.8	
T	10	31.25	9.40	6.4	1.093
F	22	68.75	11.50	4.6	
J	14	43.75	9.42	5.5	1.841
P	18	56.25	11.94	4.8	

Table 4-46

Analysis of Variance of the Bipolar Scales of the MBTI on the NWCT Scale of the MPQ (Hand Surgery Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	5	14.40	7.82	245.20	0.824
I	7	10.85	5.75	198.85	
S	12	12.33	6.61	43.69	--
N	--	--	--	--	
T	4	12.50	5.97	107.00	0.003
F	8	12.25	7.30	373.50	
J	8	13.25	7.18	361.50	0.438
P	4	10.50	5.74	99.00	

Table 4-47

Analysis of Variance of the Bipolar Scales of the MBTI on the NWCT Scale of the MPQ (Hand Rehab. Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	6	14.66	4.08	83.33	0.342
I	5	13.00	5.38	116.00	
S	9	14.55	4.79	184.22	1.000
N	2	11.00	1.41	2.00	
T	6	12.83	5.07	128.83	0.717
F	5	15.20	3.96	62.80	
J	7	13.42	5.15	159.71	0.198
P	4	14.75	3.77	42.75	

Table 4-48

SRTT Analysis: Below the Median on Number of Words Chosen (Total) NWCT
Scale of the McGill Pain Questionnaire (n=25)

Scale	<u>n</u>	%	I
E	11	44.00	.83
I	14	56.00	1.18
S	19	76.00	.95
N	6	24.00	1.20
T	10	40.00	1.10
F	15	60.00	.94
J	14	56.00	1.06
P	11	44.00	.93

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Table 4-49

SRTT Analysis: Above the Median on Number of Words Chosen (Total) NWCT
Scale of the McGill Pain Questionnaire (n=30)

Scale	<u>n</u>	%	I
E	18	60.00	1.14
I	12	40.00	.85
S	25	83.33	1.04
N	5	16.67	.83
T	10	33.33	.92
F	20	66.67	1.05
J	15	50.00	.95
P	15	50.00	1.06

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Ho 6: Sensing types and intuitive types will not differ in the number of symptoms they report on the Health History Questionnaire.

Sensing types and intuitive types did not differ in the number of symptoms they reported on the Health History Questionnaire in any group. Therefore, the null hypothesis is not rejected.

A summary of means and standard deviations for the bypass group is in Table 4-50. The ANOVAs for the hand surgery group and the hand rehab group are in Tables 4-51 and 4-52.

The SRTT analysis did not show significant overrepresentation or underrepresentation of sensing types or intuitive types in the number of symptoms reported. Summaries of the SRTT are in Tables 4-53 and 4-54. The Complete SRTT is in Appendix E.

Table 4-50

t Test for Differences between the Bipolar Scales of the MBTI on the Total Number of Symptoms (Bypass Group)

Scale	<u>n</u>	%	Mean	SD	<u>t</u>
E	18	56.25	31.38	13.9	0.055
I	14	43.75	30.21	14.0	
S	23	71.88	29.52	13.8	0.781
N	9	28.12	34.33	13.9	
T	10	31.25	36.90	12.4	2.949**
F	22	68.75	28.13	13.7	
J	14	43.75	30.50	13.7	0.018
P	18	56.25	31.16	14.2	

** $p < .01$.

Table 4-51

Analysis of Variance of the Bipolar Scales of the MBTI on the Number of Symptoms Reported (Hand Surgery Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	5	28.60	16.47	1085.20	0.090
I	7	26.00	13.54	1100.00	
S	12	27.08	14.15	2204.91	--
N	--	--	--	--	
T	4	25.00	20.14	1218.00	0.120
F	8	28.12	11.71	960.87	
J	8	24.50	14.25	1422.00	0.783
P	4	32.25	14.40	622.75	

Table 4-52

Analysis of Variance of the Bipolar Scales of the MBTI on the Number of Symptoms Reported (Hand Rehab. Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	6	40.16	19.13	1830.83	6.121*
I	5	15.60	12.13	589.20	
S	9	29.33	22.36	4000.00	0.012
N	2	27.50	7.77	60.50	
T	6	26.33	21.82	2381.33	0.213
F	5	32.20	19.94	1590.80	
J	7	23.14	10.51	662.85	1.745
P	4	39.25	30.23	2742.75	

* $p < .05$.

Table 4-53

SRTT Analysis: Below the Median on Number of Symptoms (n=28)

Scale	<u>n</u>	%	I
E	13	46.43	.88
I	15	53.57	1.13
S	24	85.71	1.07
N	4	14.29	.91
T	11	39.29	1.08
F	17	60.71	.95
J	16	57.14	1.08
P	12	42.86	.91

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Table 4-54

SRTT Analysis: Above the Median on Number of Symptoms (n=27)

Scale	<u>n</u>	%	I
E	16	59.26	1.12
I	11	40.74	.86
S	20	74.07	.93
N	7	25.93	1.30
T	9	33.33	.92
F	18	66.67	1.05
J	13	48.15	.91
P	14	51.85	1.10

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Ho 7: Introverts and extraverts will not differ on the Health Locus of Control scale.

In the gastric bypass group (Table 4-55) and the hand surgery group (Table 4-56) introverts and extraverts did not differ on the Health Locus of Control Scale.

Significant differences ($p < .05$) between introverts and extraverts were found on the health locus of control scale in the hand rehab group (Table 4-57). Therefore, the null hypothesis is rejected for the hand rehab. group.

The SRTT analysis did not show significant overrepresentations or underrepresentations of introverts or extraverts on the Health Locus of Control scale. Summaries of the SRTTs are in Tables 4-58 and 4-59. The complete SRTTs are in Appendix E.

Table 4-55

t Test for Differences Between the Bipolar Scales of the MBTI on the HLC Scale (Bypass Group)

Scale	<u>n</u>	%	Mean	SD	<u>t</u>
E	18	56.25	32.94	9.6	0.157
I	14	43.75	34.14	6.7	
S	23	71.88	35.69	5.4	6.864***
N	9	28.13	27.77	11.8	
T	10	31.25	36.70	7.2	2.249*
F	22	68.75	32.00	8.5	
J	14	43.75	34.78	4.7	0.607
P	18	56.25	32.44	10.3	

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4-56

Analysis of Variance of the Bipolar Scales of the MBTI on the HLC Scale
(Hand Surgery Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	5	40.00	8.57	294.00	1.544
I	7	30.85	14.63	1284.85	
S	12	34.66	12.87	1822.66	--
N	--	--	--	--	
T	4	37.00	9.34	260.00	0.182
F	8	33.50	14.77	1528.00	
J	8	35.87	6.79	322.87	0.196
P	4	32.25	22.09	1464.75	

Table 4-57

Analysis of Variance of the Bipolar Scales of the MBTI on the HLC Scale
(Hand Rehab. Group)

Scale	<u>n</u>	Mean	SD	SS	F
E	6	37.33	3.26	53.33	6.837*
I	5	43.80	4.91	96.80	
S	9	40.11	5.73	262.88	0.044
N	2	41.00	0.0	0.0	
T	6	41.50	5.82	169.50	0.732
F	5	38.80	4.32	74.80	
J	7	41.57	5.85	205.71	1.261
P	4	38.00	2.94	26.0	

*p < .05.

Table 4-58

SRTT Analysis: Below the Median on Health Locus of Control (n=24)

Scale	<u>n</u>	%	I
E	12	50.00	.95
I	12	50.00	1.06
S	17	70.83	.89
N	7	29.17	1.46
T	6	25.00	.69
F	18	75.00	1.18
J	12	50.00	.95
P	12	50.00	1.06

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Table 4-59

SRTT Analysis: Above the Median on Health Locus of Control (n=31)

Scale	<u>n</u>	%	I
E	17	54.84	1.04
I	14	45.16	.96
S	27	87.10	1.09
N	4	12.90	.65
T	14	45.16	1.24
F	17	54.84	.86
J	17	54.84	1.04
P	14	45.16	.96

% = Percent of total choosing this group who fall into this type

I = Self-selection index; ratio of percent of type in group to % in sample

Ho 8: Coping styles will not account for differences on the McGill Pain Questionnaire.

In testing this hypothesis I used a one-way analysis of variance of the Millon coping styles on the scales of the McGill Pain Questionnaire. The results for the gastric bypass group showed significant differences in the inhibited group ($p < .05$) and the PPI and the sensitive group ($p < .01$) on the PPI. In the hand surgical group significant differences occurred in the inhibited group in the PRIE scale ($p < .05$) and the PPI scale ($p < .01$), the forceful group on the PPI scale ($p < .01$), the forceful group on the PRIT ($p < .05$), the PRIS ($p < .05$), the PRIM ($p < .05$) scales, and the sensitive group on the PRIE ($p < .05$). In the hand rehab. group significant results were found with intraversive coping style on the PRIM scale ($p < .05$), respectful style on the PPI scale ($p < .05$), and sensitive style on the NWCS scale ($p < .05$). Therefore, the null hypothesis that coping styles will not account for differences on the McGill Pain Questionnaire is rejected. Results of the ANOVAs can be found in Tables 4-60, 4-61, and 4-62.

Summary

In an analysis of the scales of the Myers-Briggs Type Indicator and the Millon Behavioral Health Inventory on the McGill Pain Questionnaire I tested eight hypotheses to determine if the personality scales were related to pain response and if differences existed between the personality variables on various scales of the MPQ.

Table 4-60

One-way Analysis of Variance on Coping Styles on the McGill Pain Questionnaire
(Bypass Group)

	Introversive		Inhibited		Cooperative		Sociable	
	MS	F	MS	F	MS	F	MS	F
NWCT	0.04	0.00	21.75	0.77	14.35	0.50	29.84	1.07
NWCS	0.36	0.05	10.89	1.74	4.47	0.69	0.00	0.00
NWCA	1.14	0.42	0.01	0.00	0.37	0.13	6.20	2.45
NWCE	0.00	0.00	0.11	0.17	0.00	0.00	1.62	2.80
NWCM	0.00	0.00	7.80	0.62	0.28	0.02	10.96	0.88
PRIT	1.00	0.00	48.47	0.33	29.91	0.18	63.08	1.88
PRIS	0.75	0.01	25.53	0.46	17.00	0.33	22.34	0.44
PRIA	0.54	0.10	0.06	0.01	0.12	0.02	16.84	3.70
PRIE	0.07	0.02	0.23	0.09	0.09	0.03	8.01	3.45
PRIM	0.11	0.01	3.55	0.41	1.23	0.14	20.77	2.61
PPI	1.96	1.46	6.37	5.33*	1.83	1.362	0.23	0.16

	Confident		Forceful		Respectful		Sensitive	
	MS	F	MS	F	MS	F	MS	F
NWCT	0.54	0.01	15.54	0.55	25.11	0.90	0.01	0.00
NWCS	2.36	0.36	0.36	0.05	10.71	1.71	0.00	0.00
NWCA	2.57	0.97	2.57	0.97	2.57	0.97	0.42	0.15
NWCE	0.21	0.35	0.21	0.35	1.00	1.67	0.76	1.25
NWCM	2.36	0.18	6.79	0.54	0.21	0.01	9.78	0.78
PRIT	0.00	0.00	72.00	0.49	63.21	0.43	0.18	0.00
PRIS	5.46	0.10	16.61	0.32	26.46	0.52	4.93	0.09
PRIA	3.25	0.65	1.61	0.31	5.46	1.11	0.68	0.13
PRIE	1.78	0.70	1.78	0.70	0.64	0.25	1.57	0.62
PRIM	0.75	0.08	3.25	0.38	0.11	0.01	0.08	0.01
PPI	1.61	1.19	1.61	1.19	1.96	1.46	9.50	8.71**

* $p < .05$. ** $p < .01$.

Table 4-61

One-way Analysis of Variance on Coping Styles and the McGill Pain Questionnaire (Hand Surgery Group)

	Introversive		Inhibited		Cooperative		Sociable	
	MS	F	MS	F	MS	F	MS	F
NWCT	--	--	16.66	0.35	5.93	0.12	--	--
NWCS	--	--	5.04	0.45	7.28	0.66	--	--
NWCA	--	--	1.50	0.40	0.27	0.07	--	--
NWCE	--	--	0.16	0.11	0.03	0.18	--	--
NWCM	--	--	0.16	0.06	0.48	0.18	--	--
PRIT	--	--	67.37	0.21	109.09	0.37	--	--
PRIS	--	--	13.50	0.13	61.36	0.62	--	--
PRIA	--	--	6.00	0.69	2.45	0.27	--	--
PRIE	--	--	10.66	6.56*	0.91	0.35	--	--
PRIM	--	--	2.04	0.11	0.00	0.00	--	--
PPI	--	--	16.66	11.69**	4.73	1.80	--	--

	Confident		Forceful		Respectful		Sensitive	
	MS	F	MS	F	MS	F	MS	F
NWCT	56.06	1.32	106.66	2.85	4.61	0.09	6.43	0.13
NWCS	10.41	0.97	20.41	2.11	1.26	0.10	1.48	0.12
NWCA	2.40	0.65	9.60	3.26	0.77	0.20	0.08	0.02
NWCE	0.26	1.90	0.06	0.41	0.01	0.05	0.23	1.66
NWCM	4.26	1.90	6.66	3.33	0.15	0.05	0.61	0.23
PRIT	135.00	0.07	1109.40	5.87*	12.34	0.04	27.77	0.09
PRIS	384.00	0.38	345.60	4.95*	2.14	0.02	4.20	0.04
PRIA	0.60	0.06	21.60	3.02	0.77	0.08	0.77	0.08
PRIE	0.41	0.15	6.01	2.87	2.28	0.92	10.06	5.96*
PRIM	16.01	1.00	58.01	4.96*	0.11	0.00	0.68	0.03
PPI	0.81	0.27	8.81	3.98	6.68	2.76	7.20	3.03

* $p < .05$. ** $p < .01$.

Table 4-62

One-way Analysis of Variance on Coping Styles and the McGill Pain Questionnaire (Hand Rehab. Group)

	Introversive		Inhibited		Cooperative		Sociable	
	MS	F	MS	F	MS	F	MS	F
NWCT	20.68	1.00	3.40	1.15	--	--	--	--
NWCS	1.46	0.32	0.01	0.00	--	--	--	--
NWCA	3.68	1.16	2.18	0.65	--	--	--	--
NWCE	--	--	--	--	--	--	--	--
NWCM	0.02	0.00	10.24	2.16	--	--	--	--
PRTT	180.40	1.38	6.36	0.04	--	--	--	--
PRTS	24.04	0.75	11.87	0.35	--	--	--	--
PRTA	2.22	0.25	5.18	0.61	--	--	--	--
PRTE	0.24	0.12	1.09	0.59	--	--	--	--
PRTM	42.74	4.64*	0.09	0.00	--	--	--	--
PPI	1.29	0.35	0.01	0.00	--	--	--	--

	Confident		Forceful		Respectful		Sensitive	
	MS	F	MS	F	MS	F	MS	F
NWCT	4.90	0.21	27.48	1.37	6.18	0.27	58.24	3.56
NWCS	0.64	0.13	3.32	0.77	0.12	0.02	17.51	6.39*
NWCA	0.30	0.08	1.71	0.50	3.90	1.26	3.64	1.14
NWCE	--	--	--	--	--	--	--	--
NWCM	1.36	0.23	0.73	0.12	2.90	0.52	0.74	0.12
PRIT	8.36	0.05	108.73	0.78	85.35	0.60	378.24	3.48
PRIS	7.00	0.20	16.36	0.49	1.82	0.05	104.37	4.51
PRIA	0.18	0.02	1.87	0.21	10.22	1.30	9.85	1.25
PRIE	0.97	0.52	0.02	0.01	3.41	2.16	1.09	0.59
PRIM	0.09	0.00	26.88	2.45	8.08	0.61	25.47	2.88
PPI	0.30	0.08	10.18	3.81	12.12	4.94*	0.30	0.08

* $p < .05$.

The results of the PPM correlational analysis (see Appendix D) indicate that certain personality variables and certain scales of the MPQ are related as follows: The S-N dimension of the MBTI is significantly related to the NWCM scale of the McGill ($r = .3309$, $p < .05$); the Millon Introversive style is significantly related to PPI ($r = .5279$, $p < .001$); the Cooperative coping style is significantly related to the PPI ($r = .3220$, $p < .05$); and the Sensitive coping style is significantly related to the PPI ($r = .4765$, $p < .01$).

The results of the hypotheses testing are as follows:

- Ho 1: Sensing types and intuitive types will not score differently on the sensory category of the McGill Pain Questionnaire. This hypothesis was not rejected.
- Ho 2: Feeling types and thinking types will not score differently on the affective scale of the McGill Pain Questionnaire. This hypothesis was rejected for the bypass group.
- Ho 3: Judging types and perceptive types will not score differently on the evaluative scale of the McGill Pain Questionnaire. This hypothesis was not rejected.
- Ho 4: Sensing types and intuitive types will not score differently on the intensity scale (total) of the McGill Pain Questionnaire. This hypothesis was not rejected.
- Ho 5: Sensing types and intuitive types will not differ in the number of words they chose on the McGill Pain Questionnaire. This hypothesis was not rejected.

- Ho 6: Sensing types and intuitive types will not differ in the number of symptoms they reported on the Health History Questionnaire. This hypothesis was not rejected.
- Ho 7: Introverts and extraverts will not differ on the Health Locus of Control Scale. This hypothesis was rejected for the hand rehab. group.
- Ho 8: Coping styles will not account for differences on the McGill Pain Questionnaire. This hypothesis was rejected.

To test the hypotheses I used a t test as one-way ANOVA for the individual groups and the SRTT for the total sample. Significant findings are

1. Feeling types chose more affective words than thinking types ($p < .05$) in the gastric bypass group.
2. Gastric bypass subjects with inhibited ($p < .05$) and the sensitive ($p < .01$) coping styles reported significantly higher pain at the time of testing than other groups.
3. Hand surgical patients with inhibited coping styles chose significantly more evaluative words ($p < .05$) than the other groups and also reported significantly more pain when tested ($p < .01$) than the other groups.
4. Hand surgical patients with forceful coping styles had significantly higher scores on the pain rating index sensory ($p < .05$), pain rating index miscellaneous ($p < .05$), and the pain rating index total ($p < .05$) than other groups. They also reported significantly more pain when tested ($p < .01$).

5. Hand surgical patients with sensitive coping styles had significantly higher scores ($p < .05$) on the pain rating index evaluative.
6. In the hand rehab. group subjects with introversive coping style had significantly higher scores on the pain rating index miscellaneous scale ($p < .05$).
7. In the hand rehab. group subjects with respectful coping styles reported significantly ($p < .05$) more pain at the time of testing.
8. In the hand rehab. group subjects with sensitive coping styles chose significantly ($p < .05$) more words on the number of words chosen sensory scale.
9. In the hand rehab. group introverts and extraverts (MBTI) differed ($p < .05$) on the number of symptoms reported with extraverts having the higher mean.
10. In the hand rehab. group introverts and extraverts differed ($p < .05$) on the Health Locus of Control scale with introverts showing a greater degree of externality than extraverts.

CHAPTER 5 DISCUSSION

Introduction

The basic research questions of this study were as follows: Is personality type associated with a particular type of pain response? That is, is type associated with sensory, affective, or evaluative responses? Additionally, is coping style associated with pain response? If so, in what direction? Results of this investigation are presented in Chapter 4. A discussion of these results appears in this chapter, along with a description of additional findings and suggestions for further research.

Summary of the Study

Fifty-five surgical patients from two different surgical practices were recruited as volunteers for this study. Subjects filled out the Myers-Briggs Type Indicator, the Millon Behavioral Health Inventory, the Wallston Health Locus of Control scale, and a Health History Questionnaire. In addition, they were visited by the investigator while they were recuperating from surgery, and the McGill Pain Questionnaire was filled out at that time.

Because of differences in the types of surgery, the time between surgery and the postoperative visit, and significant differences within the groups on the dependent variable, the McGill Pain Questionnaire

(MPQ), three patient groups were formed. The groups were called the gastric bypass group, the hand surgery group, and the hand rehabilitation (hand rehab.) group. This procedure reduced the sample size from 55 to 32 in the gastric bypass group, 12 in the hand surgery group, and 11 in the hand rehabilitation group.

The intent of this study was to look at psychological types as a whole. However, the patient sample proved to have a very unequal representation of types on the Myers-Briggs Type Indicator (MBTI). The decision was made to look only at the main preferences on the MBTI, extraversion/introversion (EI), sensing/intuition (SN), thinking/feeling (TF), and judging/perceiving (JP), for each of the three patient groups, leaving analysis of individual types to the time when larger and more representative samples can be collected.

The Millon Behavioral Health (MBH) inventory measures coping styles, psychogenic characteristics, psychosomatic correlates, and prognostic indicators for medical populations. It was used in this study to measure individual coping styles.

The Wallston Health Locus of Control (HLOC) scale is a measurement of a patient's degree of perceived control over their own health. Subjects are described as internal or external. This instrument was used in this study to measure locus of control and test hypothesis seven (Ho 7).

The Health History Questionnaire (HHQ) is a standard symptom evaluator of the checklist type, divided by anatomical and physiological systems, and containing a category for general and mood type symptoms. This checklist was used in this study to test Ho 6.

The McGill Pain Questionnaire (MPQ) contains 11 subscales that measure the quality and the intensity of reported pain. The scales of the MPQ are the number of words chosen total (NWCT), the number of words chosen sensory (NWCS), the number of words chosen affective (NWCA), the number of words chosen evaluative (NWCE), the number of words chosen miscellaneous (NWCM), the pain rating index total (PRIT), the pain rating index sensory (PRIS), the pain rating index affective (PRIA), the pain rating index evaluative (PRIE), the pain rating index miscellaneous (PRIM), and the present pain intensity (PPI). The three patient samples differed significantly on the PRIT, the PRIA, the PRIM, and the PPI scales.

The Gastric Bypass Group

Subjects in this group were 29 females and 3 males with an average age of 37. Patients are referred to this particular surgeon for the gastric bypass procedure from all over the southeast. Because they had been morbidly obese for years, they are sophisticated regarding medical procedures and hospital routine. Since selection for this procedure involves the ability to pay, this group of patients is financially secure and generally well educated. During the postoperative interview, several of them commented that they had had to gain weight in order to qualify for the surgery, but they felt the risk was worth the hazard. Not one patient expressed preexisting concern about the surgical risk, and all of them were optimistic about anticipated results.

Studies on psychopathology in the morbidly obese (covered in Chapter 2) do not reveal any particular pattern of behaviors indicative

of those for whom the surgical intervention might present a psychological risk. In addition, these studies do not indicate that the morbidly obese have any higher degree of psychopathology than the general population. This is confirmed by clinicians who evaluate these clients for gastric bypass. They agree on the lack of psychopathology in the population.

Type distributions for this population revealed that 40% were dominant feeling types and 34% were dominant sensing types, 15% dominant intuition, 9% dominant thinking, and no preference was overrepresented or underrepresented compared to the base population. The base population in this case was the total number in all three groups ($n=55$).

In the gastric bypass group there were some interesting findings that have not been previously reported. Feeling types had a more affective response to pain than thinking types. This is probably a result of the fact that there were significantly more women in that group. Apart from gender, this particular operative procedure held special significance for those subjects who have turned to such a radical treatment for their problems. They were people who have tried many weight reduction programs over many years without success. Their overall physical health has been affected by this problem, and they have had to suffer in a society that puts great value on physical attractiveness. The affective scale measures fear and tension, using value-laden words such as "tiring, fearful, punishing" and "wretched." So, it is not too surprising that this particular group of patients might respond in a more affective way to their pain than another group such as the

hand surgery group whose problems were generally of recent origin and for whom the choice of surgery was not elective.

Subjects in the gastric bypass group with inhibited and sensitive coping styles reported significantly more pain at the time of testing (PPI) than the rest of the subjects in this group. This particular scale of the McGill Pain Questionnaire asks the patient to rate the pain at the moment of filling out the questionnaire. Thus, the results are affected by variables such as the time of last analgesic dosage, possible secondary gain from the degree of "pain," the condition of the gastrointestinal system at the time of testing, the patient's compliance with postoperative treatment, and possible other factors. For these reasons, that particular scale is more suitable for repeated use in chronic pain rather than acute pain measurement.

However, this finding may represent a variance from previous findings on degree of extraversion and reported pain. The correlational analysis reported in Chapter 4 revealed a significant relationship ($r = .39, p < .002$) between Jung's extraversion/introversion scale and Millon's inhibited style. High scorers on Millon's inhibited scale tend to be hesitant, shy, and ill at ease. Possibly the two instruments are testing a similar construct. In that case, this finding would contradict previous findings, since it was the high scorers on the inhibited scale that reported more pain, so it would be the people resembling the introverts more, rather than extraverts for this particular group. I do not know of any other reason for this particular finding, and it may represent a Type I error (that is, the rejection of a true null hypothesis).

Gastric bypass patients with the sensitive coping style also reported more pain at the time of testing. This finding may stem from the test manual's description of high scorers on the sensitive scale as moody and unpredictable, often over medicating or under medicating themselves and prone to complain about their treatment. The present pain intensity scale gives them an opportunity to validate their behavior or perhaps presents another vehicle for their complaining about treatment, such as "if the treatment were appropriate, my pain would not be so intense."

Rand, Kuldau, and Yost (1985) reported that gastric bypass patients take less medication than a similar group of gall bladder patients, and the present investigation shows that this particular population has very few significantly high scorers on the subscales of the McGill Pain Questionnaire. In addition, this investigation demonstrates that those pain subscales that are significantly higher are mostly associated with the Millon coping styles and not with the MBTI preferences. This could mean either that the MBTI is not an appropriate instrument for use in medical settings or the power of the comparison is so low that the presence of even one significant finding is evidence that type is associated with pain response and warrants a study with a larger sample and increased power.

The Hand Surgery Group

Subjects in this group were mostly people with injuries due to industrial accidents. There are 7 females and 5 males, and the average age was 47. This sample was obtained at the Lake Butler Hospital for

Hand Surgery, located in a rural farming and timber area in north-central Florida. Because of the surgeon's reputation, patients are referred from all over the southeast for treatment of hand injuries. Indeed, several arrived by helicopter during the 2 months that I was gathering data.

The type distribution for this group was very uneven and did not contain any intuitives. The sample contained 50% dominant feeling types, 41% dominant sensing types, and 8% dominant thinking types. None of the predicted associations of type and pain response with this group were significant.

The coping style scales, however, did yield some interesting findings that are consistent with previous research reported by Benedetti, Bonica, and Bellucci (1984). They state that for major hand or foot surgery, 65% to 70% of patients report severe pain for 3 days. In this study, hand surgery patients with inhibited style and forceful coping style reported significantly more pain when tested. As suggested above, the inhibited coping style may be similar to Jung's introversion. Millon describes these subjects as people who may keep their problems to themselves and they may have been reluctant to ask for analgesics. The forceful coping style is described as more verbal and probably not shy about seeking pain relief. Consequently, in this small group of hand surgery patients, we had a dichotomy on the present pain intensity scale. That is, the two styles with significantly higher scorers seem to be directly opposite styles. This suggests that some other variable that was not measured is responsible for most of the variance.

There are other findings concerning this hand surgery group that have not been previously reported. Subjects with a forceful coping style had a more sensory response to their pain as indicated by significantly higher scores on the sensory pain rating index (PRIS). In addition, they scored significantly higher on the miscellaneous category (PRIM) and the overall pain rating index (PRIT). Millon's theory claims that the strategies that guide coping behavior are concerned with how the individual performs in order to obtain the reinforcement he or she is seeking. From this perspective, the findings for the forceful personality style are logical. These subjects chose the words with the highest ranked values to describe their pain, logical for these active, independent, domineering types of people. They have learned from childhood to use the strongest language to achieve the reinforcement they seek.

Hand surgery patients with sensitive coping styles had significantly higher scores on the evaluative pain rating index (PRIE). This group is described as complainers who often have mood changes and choose the highest ranked words on the evaluative scale. This scale uses terms ranging from "annoying" to "unbearable" and is meant to measure the overall subjective intensity of the pain experience. A possible explanation for this finding is that these subjects were more dependent and passive and sought their reinforcement in a subjective, evaluative manner rather than a more objective sensory way. It is also important to note that Melzack (1975) states that most subjects, regardless of type of pain, chose an evaluative word, and they had no way of knowing these words represented a special category. If we accept the rank

ordering by Melzack (1975) of the words as valid, then significant findings here are especially meaningful. Further research in this area with a larger sample may yield an acceptable explanation for this finding or show another variable intervening.

The Hand Rehabilitation Group

Subjects in this group were surgical patients receiving physical therapy for postoperative hand pain. Their average age was 43, and there were 7 females and 4 males. Type distribution indicates that over 55% were sensing dominant, 18% thinking dominant, 18% feeling dominant, and less than 10% were intuition dominant. None of the predicted associations of type and pain response with this group were significant. As with the group of hand surgery patients, this finding may mean that the MBTI is not an appropriate instrument for a medical setting or simply that the power was too low to show anything.

The Millon coping styles have some significant associations with pain response in the hand rehabilitation group. Subjects with introversive coping styles had higher scores on the miscellaneous pain rating index scale (PRIM). Millon describes the introversive style as passive and dependent. Melzack added the miscellaneous category to the McGill Pain Questionnaire at the suggestion of patients. It consists of four groups of words. One group is reported to be particular to dental pain. Future research will no doubt yield a theoretical base for this category. Until then, I do not have any explanation for the high scorers on the miscellaneous scale.

Subjects with respectful coping styles in the hand rehabilitation group reported significantly more pain at the time of testing (PPI) than other subjects. This is an unusual finding since Millon asserts that these people tend to deny symptoms. Perhaps this finding is significant because of the length of time these patients have had their suffering. Since these subjects were recruited in the physical therapy department, some of them may be discouraged by the length of their illness. In addition, many of them were on "Workman's Compensation," and this may have affected their pain perception.

The issue of secondary gain has not been addressed in this study because it is generally pertinent to chronic pain studies. At the time of recruitment, the investigator spent about an hour determining the suitability of each patient for the study, examining factors in their previous surgical history. To assist in this determination and establish rapport, patients were asked to explain their injury and general feelings about the event. This particular group resembled chronic pain patients in their responses. Several of them complained of depression with many of the attendant symptoms. In addition, many were receiving negative feedback from their families about the validity of their pain. An unfavorable response from the "Workman's Compensation Office" would be spread rapidly about the clinic, and other patients would start discussing their claims and the suitability of their attorney. I mention these issues because any findings with this group must be considered in the light of this background. In addition to this resemblance to chronic pain patients, this group had another distinguishing factor. Thirty-five patients from this clinic were

interviewed. Several people were willing to participate but were unable to read. All others were screened informally for functional illiteracy, but since a reading test was not used, there may have been some with this disability included.

Taken in the context of the background of the hand rehabilitation group, none of the findings are surprising. The sensitive coping styles (the complainers) chose more sensory words, and the respectful styles complained of more pain. The only surprise here was the paucity of findings, for if these people were truly similar to chronic pain patients, they should have had more complaints. Or perhaps the findings represent a response to demand characteristics of the interview. Subjects were told that this was a pain study, and they could well have decided not to disappoint me by not reporting any pain.

Conclusions

Although the intent of the study was the examination of personality type as described by Jung and pain response, the three groups differed on type of surgery, time of surgery, and 4 out of the 11 scales of the dependent variable so the decision was made to look at only the main preferences EI, SN, TF and JP. When type preferences were analyzed separately, there were very few significant differences in their reports of pain response, and the few significant differences were not consistent for all three patient groups.

The findings on coping styles and pain response were also not consistent for all three groups. There is some possibility that the hand rehabilitation group was actually a chronic pain sample, but even

deleting this group, the findings were not consistent for the other two groups. Part of this inconsistency may be due to demographic variables that were not controlled. The gastric bypass group was obtained in a standard metropolitan statistical area (urban), while the hand surgery group was drawn from a rural farming and logging community.

Previous research (Bond, 1973; Eysenck, 1961) indicates that the degree of extraversion is related to pain response. This present study both supports and contradicts that evidence. It is supportive in the finding that extraverts had significantly higher scores on the Health Locus of Control scale, and this has been demonstrated to be related to pain response (Clum, Scott, & Burnside, 1979). It is contradictory in the finding that inhibited subjects in the bypass group reported more pain than those with lower scores on that scale.

The finding that coping styles were associated with pain response is consistent with previous research by Taenzer, Melzack, and Jeans (1986). They report that coping styles were significant predictors of pain scores, accounting for 28% of the variance with the defensive high anxious group having the highest score. In the present study, using a different measure for coping styles, it was found that subjects with inhibited, forceful, and sensitive coping styles reported significantly higher pain scores. Perhaps this study, in asking about pain, gave patients an opportunity to examine and discuss their pain in ways other than they had known before. Since coping styles may be determined by the type of reinforcement they generate, this finding supports Melzack's theory that motivational factors affect pain response.

As Egbert (1985) contends, "the physical recovery of surgical patients is exquisitely sensitive to psychological factors" (p. 56). The studies cited in Chapter 2 support this statement. This study suggests personality type and coping styles may have a role in pain response that is related to particular procedures and particular populations. The management of postoperative pain is dependent on an understanding of individual differences that mediate a given response. Because appropriate psychological intervention can affect the incidence of postoperative complications and the length of hospital stay, it is important to continue to investigate psychological factors that may influence the patient's response to procedures. Appropriate psychological intervention could be idiosyncratic, considering individual differences such as type preference and coping style.

In summary, the personality type preferences identified by this study as being associated with pain response are extraversion/introversion for the hand rehabilitation group and thinking/feeling for the gastric bypass group. The coping styles most associated with pain response are the inhibited style and sensitive style for the gastric bypass group; the inhibited style and forceful style for the hand surgery group; and the introversive style, respectful style, and sensitive style for the hand rehabilitation group.

Recommendation for Future Research

Although this study has identified some variables which appear to be associated with pain response, some inconsistencies in these findings, and taken with other findings, suggest a need to search for

other variables of possible import or to repeat the same study with a larger population. The most notable inconsistency is in the role of extraversion in pain response.

Although there were very few significant findings for the possible role of type in this study, there were some interesting nonsignificant trends. For example, in the hand rehabilitation group, the sensing types had higher pain scores on several measures than the intuitive types, yet in the bypass group, the opposite was the case. Would this difference be significant in a larger sample? Is it due to demographic or social factors or to possible chronicity?

Although an attempt was made to collect data in a consistent time frame postoperatively, the attempt was not always uniformly successful. Because the hand surgical patients were usually discharged several hours after surgery, they were asked to fill out the McGill Pain Questionnaire the next day after the block anesthetic had worn off. Since there was no apparent way the investigator could visit them in different parts of the southeast to collect this data, it may have been inconsistent. A study should be done that can control more strictly for time of data collection.

The finding regarding the role of personality type could mean that the Myers-Briggs Type Indicator is not suitable for medical settings or, that with such low power, any significant findings indicate that type is a possible major factor. If so, this study needs to be repeated and confirmed with a larger sample and increased power.

Demographic variables were not controlled for in this study, and it is quite possible that these could account for some differences. Again,

a larger study with more controlled variables would serve to minimize the importance of such factors.

APPENDIX A
MILLON BEHAVIORAL HEALTH INVENTORY

Basic Coping Styles (Scales 1-8)

The following descriptions characterize patients with a distinctive high score on the scale noted. For most patients, these characteristics usually blend with other features in a configural pattern of several scales. In addition to noting general coping styles, interpretive reports attempt to identify the manner in which patients are likely to relate to health personnel, services, and medical regimens.

Scale 1: Introversive Style (32 items)

High scorers are rather colorless and emotionally flat, tending to be quiet and untalkative. They often appear unconcerned about their problems. Typically, they are lacking in energy, are vague and difficult to pin down concerning symptoms, and may be passive with regard to taking care of their physical state. Health care professionals should give clear directions and not expect these patients to take the initiative in following a treatment plan.

Scale 2: Inhibited Style (43 items)

High scorers tend to be hesitant with others and are often shy and ill-at-ease. One must be careful in dealing with them since they are easily hurt, and often concerned over what others may do to them. As a

result, health care professionals will have to devote extra effort in establishing rapport. Because these patients may fear that others will take advantage of them, they may keep their problems to themselves. However, they do seek understanding and attention. With a sympathetic attitude, one should be able to get them to be cooperative.

Scale 3: Cooperative Style (33 items)

High scorers tend to be eager to attach themselves to a supportive professional and will follow advice closely. However, these patients do not usually take the initiative in seeking treatment and will expect to be told exactly what to do. They may be inclined to deny the existence of real problems. Health care personnel may have to probe carefully and ask questions explicitly. These patients become very dependent and may resist when suggestions are made for referral to other doctors of clinics.

Scale 4: Sociable Style (40 items)

High scorers tend to be outgoing, talkative, and charming. However, these patients may be changeable in their likes and dislikes. They may be very cooperative initially in following the treatment plan, but this may be short-lived. These patients often are more concerned with "appearing nice and attractive" than with solving their problems. Dependability in meeting appointments and taking necessary medications is likely to be low.

Scale 5: Confident Style (33 items)

High scorers act in a calm and confident manner. However, they are likely to fear bodily ailments and will thus be motivated to follow any treatment plan that will ensure their well-being. They may expect to be given special treatment and will tend to take advantage of staff members. Although this behavior may be troublesome at times, it is important that these patients are treated professionally and receive complete explanations of their course of treatment. If these patients are impressed with the critical importance to their health of following the medical regimen, they will do so carefully.

Scale 6: Forceful Style (33 items)

High scorers tend to be somewhat domineering and tough-minded. The health care team should be careful not to feel intimidated or provoked. A straight-forward approach in which the professional "pulls no punches" and makes no apologies would be best. Given their tendency to be distrustful, these patients may not follow planned treatment regimens. It will be necessary for the team to work hard to get these patients to follow the prescribed treatment course.

Scale 7: Respectful Style (42 items)

High scorers are likely to be responsible, conforming, and cooperative. They hold their feelings inside and will try to impress the health care team as being well-controlled and serious-minded. These patients usually take medications carefully and follow therapeutic recommendations. There is a strong tendency, however, to deny symptoms;

many may have waited a long time before seeking treatment. They do not like being sick since it signifies weakness and inefficiency.

Scale 8: Sensitive Style (48 items)

High scorers tend to be unpredictable and moody. They are often erratic in following a treatment plan--overmedicating or undermedicating without telling the physician. These patients often seem displeased and dissatisfied with their physical and psychological state. At times, they will complain a lot about treatment, but this can quickly switch to expressions of guilt. Mood changes seem to occur for no clearcut reason. Rapport may be easy on some days but difficult on others.

Psychogenic Attitude Scales (Scales A-F)

The scales of this section represent the personal feelings and perceptions of the patient regarding different aspects of psychological stress which increase psychosomatic susceptibility or aggravate the course of a current disease. Scores are gauged by comparing these attitudes to those expressed by a cross-section of both healthy and physically ill adults of the same sex. The first two of these scales pertain to relatively objective events which have been experienced as either chronically or recently stressful. The second two relate to attitudes that intensify the subjective impact of past or future stressful events. The third set of two scales attempts to gauge the status of two significant sources of potential stress, interpersonal relationships and bodily functioning.

Scale A: Chronic Tension (29 items)

High levels of stress have repeatedly been found to relate to the incidence of a variety of diseases. More specifically, qualitative studies of chronic stress, such as persistent job tensions or marital problems, have been carried out with particular reference to their impact on heart diseases, often addressed as Type A-Type B behavior (Friedman & Rosenman, 1974; Gersten, Frii, & Lengner, 1976; Jenkins, 1976; Rahe, 1977). High scorers on this scale are disposed to suffer various psychosomatic and physical ailments, notably in the cardiovascular and digestive systems. They seem constantly on the go, live under considerable self-imposed pressure, and have trouble relaxing. Where feasible, discussions should be initiated by the health care practitioner with the thought of reducing tensions and slowing down the rapid pace of life these patients pursue.

Scale B: Recent Stress (20 items)

This scale addresses the patients' perceptions of the prevalence of stress in the recent past. This is a phenomenological assessment similar to the Social Readjustment Rating Scale (Holmes & Rahe, 1967) and Sarason and Johnson's Life Experience Survey (1978). High scorers on this scale have an increased susceptibility to serious illness for the year following test administration. Recent marked changes in their life predicts a significantly higher incidence of poor physical and psychological health than in the population-at-large (Andrew, 1970; Rahe & Arthur, 1968). Regular and frequent contact with medical personnel

would be advisable during this period so as to anticipate and avert the possibility of serious illness.

Scale C: Premorbid Pessimism (40 items)

This scale addresses the dispositional attitude of helplessness-hopelessness implicated in the appearance or exacerbation of a variety of diseases including multiple sclerosis, ulcerative colitis, and cancer (Mei-Tal, Meyerowitz, & Engel, 1970; Paull & Hislop, 1974; Schmale, 1972; Stavraky, Buck, Lott, & Wanklin, 1968). It differs from other "depression" indices such as found in the following scale, by noting characterologic tendencies toward viewing the world in a negative manner. High scorers on this scale are disposed to interpret life as a series of troubles and misfortunes and are likely to intensify the discomforts they experience with real physical and psychological difficulties. Health care team members should attempt to assess the complaints of these patients carefully and objectively. Support and reassurance would be helpful to moderate a tendency to aggravate difficulties.

Scale D: Future Despair (38 items)

This scale focuses on the patients' willingness to plan and look forward to the future as addressed in a number of studies (Engel, 1968; Wright, 1960). This is more likely than the previous scale to tap the patient's response to current difficulties and circumstances rather than a general or lifelong tendency to view things negatively. High scorers do not look forward to a productive future life and view medical

difficulties as seriously distressing and potentially life-threatening. The bleak outlook and consequent poor prognosis that characterizes these patients will require considerable support and encouragement on the part of health personnel.

Scale E: Social Alienation (33 items)

Level of familial and friendship support, both real and perceived, appears to be a significant moderator of the impact of various life stresses (Cobb, 1976; Rabkin & Struening, 1976). This sense of aloneness has been detailed in sociological literature (Berkman, 1969; Comstock & Partridge, 1972; Moss, 1977; Parkes, Benjamin, & Fitzgerald, 1969). High scorers are prone to physical and psychological ailments and a poor adjustment to hospitalization is common. They perceive low levels of family and social support and may not seek medical assistance until illness is extremely discomforting. Every effort should be made to provide these patients with opportunities to develop significant rapport and confidence in their health care team.

Scale F: Somatic Anxiety (34 items)

All of the above stressors seem to be significantly modulated upward or downward by the preoccupations and fears that patients may express about their physical state. Studies of what may be called somatic anxiety reflect the general concerns that patients have about their bodies (Lipsitt, 1970; Lowy, 1977; Lucente & Fleck, 1972; Mechanic & Volkart, 1960). High scorers on this scale tend to be hypochondriacal and susceptible to various minor illnesses. They experience an abnormal

amount of fear concerning bodily functions and are likely to overreact to the discomforts of surgery and hospitalization. The health professional should be sensitive to the unwarranted concerns of these patients and seek to minimize their consequences by engaging in periodic supportive and reassuring discussions.

Psychosomatic Correlates Scales (Scales MM-00)

The scales comprising this section are designed for use only with patients who have previously been medically diagnosed as exhibiting one of a number of specific disease syndromes. The scores of each scale gauge the extent to which the patient's responses are similar to comparably diagnosed patients whose illness has been judged substantially psychosomatic or whose course has been complicated by emotional or social factors.

Scale MM: Allergic Inclination (34 items)

High scorers among patients with allergic disorders--urticaria, dermatitis, asthma--experience emotional factors as significant precipitants of their disease process. The role of these influences among low scorers is likely to be minimal.

Scale NN: Gastrointestinal Susceptibility (27 items)

Higher scorers among patients with gastrointestinal disorders--ulcers, colitis, dyspepsia--are likely to react to psychological stress with an increase in the frequency and severity of symptomatology.

Stress is not likely to be a significant precipitant among low scorers with these ailments.

Scale 00: Cardiovascular Tendency (38 items)

High scorers among patients with cardiovascular symptoms--hypertension, angina pectoris--are susceptible to a significant increase in complaint symptomatology under conditions of psychic tension. Emotional factors are not likely to contribute significantly to such symptomatology among low scorers.

Prognostic Indices Scales (Scales PP-RR)

The scales comprising this section seek to identify future treatment problems or difficulties that may arise in the course of the patient's illness. The scores of each scale gauge the extent to which the patient's responses are similar to patients whose course of illness or treatment has been more complicated and unsatisfactory than is typical.

Scale PP: Pain Treatment Responsivity (42 items)

High scorers on this scale are similar in their results to patients whose management with a traditional medical treatment program was less than satisfactory. It is also probable that psychological factors may maintain the pain behaviors.

Scale QQ: Life Threat Reactivity (42 items)

High scorers who are currently suffering a chronic progressive life threatening illness--metastatic carcinoma, renal failure, congestive heart disease--are likely to deteriorate more rapidly than is typical among patients with a comparable physical illness. Low scorers are judged as likely to progress through a more benign and favorable course.

Scale RR: Emotional Vulnerability (12 items)

High scorers facing major surgery or other life-dependent treatment programs--open heart procedures, hemodialysis, chemotherapy--are vulnerable to severe disorientation, depressions, or frank psychotic episodes. Severe reactions of this nature are not probable among low scorers.

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APPENDIX B
LETTER TO SURGEONS

December 1, 1985

Dear Doctor:

As a final part of the requirements for my Ph.D. degree, I am examining the relationship between personality type, coping styles, and pain response in patients having elective surgery. I am requesting several physicians' permission to interview their patients before and after surgery. I hope you will be able to do me this favor because I need to complete this part of the degree process. Naturally, patients will be informed about the study, and participation will be voluntary.

In the first part of the study, patients will complete some general psychological evaluations in their own homes prior to admission to the hospital. The second part will consist of my visiting them in the hospital after surgery for 15-30 minutes and evaluating the response to pain.

I would like to meet with you at your convenience to explain my study in more detail and answer any questions you may have. Please have your receptionist call me at home (375-7557) to set up a brief appointment. If I am not in, an answering machine is on the line.

Thank you for your consideration. A similar letter is being sent to Doctor Smith.

Sincerely yours,

Joan C. Schoeffel

APPENDIX C
CONSENT FORM AND MEMORANDUM

Dear Patient:

I am a graduate student in Foundations of Education at the U. of Florida, conducting research on how different people respond to surgery. Would you do me the favor of participating in this research, because it will add to the knowledge of individual responses to surgery?

The research will involve two parts. The first consists of filling out some psychological and general health assessment questionnaires. The second involves answering some questions about your experience after surgery. The questions are designed to measure normal health and general personality characteristics. I will be glad to review these with you when you are ready.

If you are willing to participate in this study, please sign below, and you will be given materials for the first part. When you are filling in the questionnaires, mark the answer that seems most appropriate. If someone helps you in reading or marking the papers, try to give only your own answers. With your doctor's permission, I will visit you in the hospital for the second part.

The immediate benefit of this study will be your contribution to knowledge. No monetary compensation is involved, and you are free to withdraw from the study at any time. Your name will be converted to a number known only to me to protect the confidentiality of your answers.

If you have any questions, my home phone number is 375-7557. Thank you for your consideration.

Sincerely,

Joan C. Schoeffel

I have read and understand the procedure described above. I agree to participate in the procedure and have received a copy of this description.

Patient

Date

Witness

Date

Principal Investigator

Date

Memorandum

To: Patients Participating in the Surgical Response Study

From: Joan C. Schoeffel, Principal Investigator

Subject: Instructions for completion of questionnaires

It is very important that you complete these forms yourself. If you need help in reading or completing the boxes, please try to be sure that whomever helps you uses your answers. If you are unable to answer accurately, estimate. Otherwise guess as closely as you can. Try to complete as many questions as possible.

If you have any questions about the tests, please phone me at 375-7557. If I am not at home, there is an answering machine on the line.

When you have finished filling out the answer sheets, please put all the materials in the enclosed envelope and mail it. Stamps have been affixed for your convenience.

Thank you again for the favor of your assistance, because I feel this research study will be a definite contribution to the body of information.

APPENDIX D
CORRELATIONS BETWEEN THE SCALES OF THE MCGILL PAIN QUESTIONNAIRE, THE
MYERS-BRIGGS TYPE INDICATORS, AND THE MILLON BEHAVIORAL HEALTH
INVENTORY COPING STYLES SCALES, n=55

Var.	NWCT	NWCS	NWCA	NWCE	NWCM
E/I var. 28	0.0220	-0.0986	0.0961	-0.0385	0.1561*
S/N var. 29	0.1067	0.1118	0.1478	0.2203	0.3309
F/T var. 30	0.0881	-0.1324	0.0542	0.2259	-0.0701
J/P var. 31	0.2088	0.2556	0.1802	0.1876	0.0793
Introversive var. 32	-0.0818	-0.1926	-0.1331	0.0103	0.1933
Inhibited var. 33	0.2259	-0.0242	0.1173	-0.0238	-0.1924
Cooperative var. 34	-0.0574	-0.0261	-0.0779	0.0099	-0.0898
Sociable var. 35	0.0633	0.1827	-0.0784	0.1225	0.0998
Confident var. 36	0.0131	0.0845	-0.1554	0.0673	0.0422
Forceful var. 37	-0.0353	-0.0047	-0.929	0.1708	0.0899
Respectful var. 38	0.0035	-0.0760	-0.0185	-0.1552	-0.0116
Sensitive var. 39	0.2488	0.2741	0.2359	0.2607	-0.2148

* $p < .05$.

Var.	PRIT	PRIS	PRIA	PRIE	PRIM	PPI
E/I var. 28	0.1137	0.0535	0.0936	0.2188	0.1500	-0.0434
S/N var. 29	0.2517	0.2236	0.2473	0.2141	0.1928	-0.1813
F/T var. 30	0.0253	-0.0150	0.0636	0.1146	0.0294	0.2424
J/P var. 31	0.1287	0.0658	0.2496	0.0275	0.1667	-0.2209
Introversive var. 32	-0.0561	-0.0594	-0.0825	0.0366	0.0427	0.5279***
Inhibited var. 33	-0.0088	0.0205	0.1057	0.0027	-0.0963	-0.2674
Cooperative var. 34	-0.0533	-0.0235	-0.1525	-0.0211	-0.0352	0.3220*
Sociable var. 35	-0.0150	0.0338	-0.0897	-0.0901	-0.0264	0.1702
Confident var. 36	0.0033	0.0256	-0.1522	-0.0697	0.1064	0.2235
Forceful var. 37	-0.0621	-0.0610	-0.0082	-0.0637	-0.0830	-0.2507
Respectful var. 38	0.1356	0.1289	-0.0033	0.1036	0.1945	0.1329
Sensitive var. 39	0.1921	0.2010	0.2082	0.1293	0.0768	-0.4765**

* $p < .05$. ** $p < .01$. *** $p < .001$.

APPENDIX E
SELECTION RATIO TYPE TABLES (SRTT)

Table E-1

SRTT Analysis: Below the Median on Number of Words Chosen (Sensory)
on the McGill Pain Questionnaire

N= 24

SENSING TYPES		INTUITIVE TYPES			N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING				
I S T J	I S F J	I N F J	I N T J	JUDGING INTROVERTS	E	9 37.50	.71"
N= 4	N= 2	N= 0	N= 2		I	15 62.50	1.32"
%=16.67	%= 8.33	%= 0.00	%= 8.33		S	18 75.00	.94
I= 1.53	I= .76	I= 0.00	I= 2.29		N	6 25.00	1.25
I S T P	I S F P	I N F P	I N T P	PERCEPTIVE EXTROVERTS	T	9 37.50	1.03
N= 0	N= 5	N= 2	N= 0		F	15 62.50	.98
%= 0.00	%=20.83	%= 8.33	%= 0.00		J	13 54.17	1.03
I= 0.00	I= 1.43	I= 1.53	I= 0.00		P	11 45.83	.97
E S T P	E S F P	E N F P	E N T P	JUDGING INTROVERTS	IJ	8 33.33	1.31
N= 2	N= 2	N= 0	N= 0		IP	7 29.17	1.34
%= 8.33	%= 8.33	%= 0.00	%= 0.00		EP	4 16.67	.65
I= .76	I= 1.15	I= 0.00	I= 0.00		EJ	5 20.83	.76
E S T J	E S F J	E N F J	E N T J	PERCEPTIVE EXTROVERTS	ST	6 25.00	.81
N= 0	N= 3	N= 1	N= 1		SF	12 50.00	1.02
%= 0.00	%=12.50	%= 4.17	%= 4.17		NF	3 12.50	.86
I= 0.00	I= .76	I= 2.29	I= 2.29		NT	3 12.50	2.29
				JUDGING INTROVERTS	SJ	9 37.50	.82
					SP	9 37.50	1.09
					NF	2 8.33	.65
					NJ	4 16.67	2.29"
				JUDGING INTROVERTS	TJ	7 29.17	1.23
					TP	2 8.33	.65
					FP	9 37.50	1.09
					FJ	6 25.00	.86
				JUDGING INTROVERTS	IN	4 16.67	1.83
					EN	2 8.33	.76
					IS	11 45.83	1.20
					ES	7 29.17	.70

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

- " IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;
 - # IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;
 - * IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.
- (UNDERScore) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
 I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-2

SRIT Analysis: Above the Median on Number of Words Chosen (Sensory)
on the McGill Pain Questionnaire

N= 31

SENSING TYPES				INTUITIVE TYPES				J U D G I N G	N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING	WITH FEELING	WITH THINKING	WITH FEELING	WITH THINKING				
I S T J	I S F J	I N F J	I N T J	I S T P	I S F P	I N F P	I N T P	J U D G I N G I N T R O V E R T S P E R C E P T I V E S E X T R A V E R S E S	E	20 64.52	1.22"
N= 2	N= 4	N= 0	N= 0	N= 1	N= 3	N= 1	N= 0		I	11 35.48	.75"
%= 6.45	%=12.90	%= 0.00	%= 0.00	%= 3.23	%= 9.68	%= 3.23	%= 0.00		S	26 83.87	1.05
I= .59	I= 1.18	I= 0.00	I= 0.00	I= 1.77	I= .67	I= .59	I= 0.00		N	5 16.13	.81
I S T J	I S F J	I N F J	I N T J	E S T P	E S F P	E N F P	E N T P		T	11 35.48	.98
N= 4	N= 2	N= 4	N= 0	N= 4	N= 2	N= 4	N= 0		F	20 64.52	1.01
%=12.90	%= 6.45	%=12.90	%= 0.00	%=12.90	%= 6.45	%=12.90	%= 0.00		J	16 51.61	.98
I= 1.18	I= .89	I= 1.77	I= 0.00	I= 1.18	I= .89	I= 1.77	I= 0.00		P	15 48.39	1.02
E S T J	E S F J	E N F J	E N T J	E S T P	E S F P	E N F P	E N T P		IJ	6 19.35	.76
N= 4	N= 6	N= 0	N= 0	N= 4	N= 6	N= 0	N= 0		IP	5 16.13	.74
%=12.90	%=19.35	%= 0.00	%= 0.00	%=12.90	%=19.35	%= 0.00	%= 0.00		EP	10 32.26	1.27
I= 1.77	I= 1.18	I= 0.00	I= 0.00	I= 1.77	I= 1.18	I= 0.00	I= 0.00		EJ	10 32.26	1.18
									ST	11 35.48	1.15
									SF	15 48.39	.99
									NF	5 16.13	1.11
									NT	0 0.00	0.00
									SJ	16 51.61	1.14
									SP	10 32.26	.93
									NP	5 16.13	1.27
									NJ	0 0.00	0.00"
								J U D G I N G	TJ	6 19.35	.82
									TP	5 16.13	1.27
									FP	10 32.26	.93
									FJ	10 32.26	1.11
									IN	1 3.23	.35
									EN	4 12.90	1.18
									IS	10 32.26	.84
									ES	16 51.61	1.23

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

" IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERScore) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
 I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-3

SRTT Analysis: Below the Median on the Pain Rating Index
(Sensory) of the McGill Pain Questionnaire

N= 27

SENSING TYPES		INTUITIVE TYPES			N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING				
I S T J	I S F J	I N F J	I N T J	J U D G I N G I N T R O V E R T S P E R C E P T I V E S E X T R A V E R T S J U D G I N G	E	13 48.15	.91
					I	14 51.85	1.10
N= 4	N= 2	N= 0	N= 2		S	20 74.07	.93
%=14.81	%= 7.41	%= 0.00	%= 7.41		N	7 25.93	1.30
I= 1.36	I= .68	I= 0.00	I= 2.04		T	10 37.04	1.02
					F	17 62.96	.99
					J	15 55.56	1.05
					P	12 44.44	.94
I S T P	I S F P	I N F P	I N T P		IJ	8 29.63	1.16
					IP	6 22.22	1.02
N= 0	N= 5	N= 1	N= 0		EP	6 22.22	.87
%= 0.00	%=18.52	%= 3.70	%= 0.00		EJ	7 25.93	.95
I= 0.00	I= 1.27	I= .68	I= 0.00		ST	7 25.93	.84
					SF	13 48.15	.98
E S T P	E S F P	E N F P	E N T P	J U D G I N G I N T R O V E R T S P E R C E P T I V E S E X T R A V E R T S J U D G I N G	NF	4 14.81	1.02
					NT	3 11.11	2.04
N= 2	N= 2	N= 2	N= 0		SJ	11 40.74	.90
%= 7.41	%= 7.41	%= 7.41	%= 0.00		SP	9 33.33	.96
I= .68	I= 1.02	I= 1.02	I= 0.00		NP	3 11.11	.87
					NJ	4 14.81	2.04
					TJ	8 29.63	1.25
					TP	2 7.41	.58
E S T J	E S F J	E N F J	E N T J		FP	10 37.04	1.07
					FJ	7 25.93	.89
N= 1	N= 4	N= 1	N= 1		IN	3 11.11	1.22
%= 3.70	%=14.81	%= 3.70	%= 3.70		EN	4 14.81	1.36
I= .51	I= .91	I= 2.04	I= 2.04		IS	11 40.74	1.07
					ES	9 33.33	.80

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

" IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

* IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERScore) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-4

SRIT Analysis: Above the Median on the Pain Rating Index
(Sensory) of the McGill Pain Questionnaire

N= 28

SENSING TYPES		INTUITIVE TYPES			N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING				
I S T J	I S F J	I N F J	I N T J	JUDGING	E	16 57.14	1.08
N= 2	N= 4	N= 0	N= 0		I	12 42.86	.91
%= 7.14	%=14.29	%= 0.00	%= 0.00		S	24 85.71	1.07
I= .65	I= 1.31	I= 0.00	I= 0.00		N	4 14.29	.71
I S T P	I S F P	I N F P	I N T P	INTROVERTS	T	10 35.71	.98
N= 1	N= 3	N= 2	N= 0		F	18 64.29	1.01
%= 3.57	%=10.71	%= 7.14	%= 0.00		J	14 50.00	.95
I= 1.96	I= .74	I= 1.31	I= 0.00		P	14 50.00	1.06
E S T P	E S F P	E N F P	E N T P	PERCEPTIVES	IJ	6 21.43	.84
N= 4	N= 2	N= 2	N= 0		IP	6 21.43	.98
%=14.29	%= 7.14	%= 7.14	%= 0.00		EP	8 28.57	1.12
I= 1.31	I= .98	I= .98	I= 0.00		EJ	8 28.57	1.05
E S T J	E S F J	E N F J	E N T J	EXTROVERTS	ST	10 35.71	1.16
N= 3	N= 5	N= 0	N= 0		SF	14 50.00	1.02
%=10.71	%=17.86	%= 0.00	%= 0.00		NF	4 14.29	.98
I= 1.47	I= 1.09	I= 0.00	I= 0.00		NT	0 0.00	0.00
				JUDGING	SJ	14 50.00	1.10
					SP	10 35.71	1.03
					NP	4 14.29	1.12
					NJ	0 0.00	0.00
				AVERSIVES	TJ	5 17.86	.76
					TP	5 17.86	1.40
					FP	9 32.14	.93
					FJ	9 32.14	1.10
				JUDGING	IN	2 7.14	.79
					EN	2 7.14	.65
					IS	10 35.71	.94
					ES	14 50.00	1.20

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

" IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERSCORE) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.

I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-5

SRTI Analysis: Below the Median on the Number of Words Chosen
Affective (NWCA) Scale of the McGill Pain Questionnaire

N= 27

SENSING TYPES		INTUITIVE TYPES			N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING				
I S T J	I S F J	I N F J	I N T J	J U D G I N G I N T R O V E R T S P E R C E P T I V E S E X T R A V E R T S J U D G I N G	E	12 44.44	.84
					I	15 55.56	1.18
N= 4	N= 3	N= 0	N= 2		S	21 77.78	.97
%=14.81	%=11.11	%= 0.00	%= 7.41		N	6 22.22	1.11
I= 1.36	I= 1.02	I= 0.00	I= 2.04		T	12 44.44	1.22
					F	15 55.56	.87
					J	16 59.26	1.12
					P	11 40.74	.86
I S T P	I S F P	I N F P	I N T P		IJ	9 33.33	1.31
					IP	6 22.22	1.02
N= 0	N= 5	N= 1	N= 0		EP	5 18.52	.73
%= 0.00	%=18.52	%= 3.70	%= 0.00		EJ	7 25.93	.95
I= 0.00	I= 1.27	I= .68	I= 0.00		ST	9 33.33	1.08
					SF	12 44.44	.91
E S T P	E S F P	E N F P	E N T P		NF	3 11.11	.76
					NT	3 11.11	2.04
N= 3	N= 1	N= 1	N= 0		SJ	12 44.44	.98
%=11.11	%= 3.70	%= 3.70	%= 0.00		SP	9 33.33	.96
I= 1.02	I= .51	I= .51	I= 0.00		NP	2 7.41	.58
					NJ	4 14.81	2.04
E S T J	E S F J	E N F J	E N T J		TJ	9 33.33	1.41
					TP	3 11.11	.87
N= 2	N= 3	N= 1	N= 1		FP	8 29.63	.86
%= 7.41	%=11.11	%= 3.70	%= 3.70		FJ	7 25.93	.89
I= 1.02	I= .68	I= 2.04	I= 2.04		IN	3 11.11	1.22
					EN	3 11.11	1.02
					IS	12 44.44	1.16
					ES	9 33.33	.80

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

" IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

* IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERScore) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Scheffé study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-6

SRTT Analysis: Above the Median on the Number of Words Chosen
Affective (NWC) Scale of the McGill Pain Questionnaire

N= 28

SENSING TYPES		INTUITIVE TYPES				N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING					
I S T J	I S F J	I N F J	I N T J	J U D G I N G I N T R O V E R T S P E R C E P T I V E S E X T R A V E R T S J U D G I N G	E	17	60.71	1.15
					I	11	39.29	.83
N= 2	N= 3	N= 0	N= 0		S	23	82.14	1.03
%= 7.14	%=10.71	%= 0.00	%= 0.00		N	5	17.86	.89
I= .65	I= .98	I= 0.00	I= 0.00		T	8	28.57	.79
					F	20	71.43	1.12
					J	13	46.43	.88
					P	15	53.57	1.13
I S T P	I S F P	I N F P	I N T P		IJ	5	17.86	.70
					IP	6	21.43	.93
N= 1	N= 3	N= 2	N= 0		EP	9	32.14	1.26
%= 3.57	%=10.71	%= 7.14	%= 0.00		EJ	8	28.57	1.05
I= 1.96	I= .74	I= 1.31	I= 0.00		ST	8	28.57	.92
					SF	15	53.57	1.09
E S T P	E S F P	E N F P	E N T P		NF	5	17.86	1.23
					NT	0	0.00	0.00
N= 3	N= 3	N= 3	N= 0		SJ	13	46.43	1.02
%=10.71	%=10.71	%=10.71	%= 0.00		SP	10	35.71	1.03
I= .98	I= 1.47	I= 1.47	I= 0.00		NP	5	17.86	1.40
					NJ	0	0.00	0.00
E S T J	E S F J	E N F J	E N T J		TJ	4	14.29	.60
					TP	4	14.29	1.12
N= 2	N= 6	N= 0	N= 0		FP	11	39.29	1.14
%= 7.14	%=21.43	%= 0.00	%= 0.00		FJ	9	32.14	1.10
I= .98	I= 1.31	I= 0.00	I= 0.00		IN	2	7.14	.79
					EN	3	10.71	.98
					IS	9	32.14	.84
					ES	14	50.00	1.20

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

* IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

- (UNDERScore) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Scheffé study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-7

SRTT Analysis: Below the Median on the Pain Rating Index Affective (PRIA) of the McGill Pain Questionnaire

N= 28

SENSING TYPES		INTUITIVE TYPES			N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING				
I S T J	I S F J	I N F J	I N T J	J U D G I N G	E	12 42.86	.81
N= 4	N= 3	N= 0	N= 2		I	16 57.14	1.21
%=14.29	%=10.71	%= 0.00	%= 7.14		S	22 78.57	.98
I= 1.31	I= .98	I= 0.00	I= 1.96		N	6 21.43	1.07
I S T F	I S F P	I N F P	I N T P	I N T R O V E R T S	T	12 42.86	1.18
N= 0	N= 6	N= 1	N= 0		F	16 57.14	.90
%= 0.00	%=21.43	%= 3.57	%= 0.00		J	16 57.14	1.08
I= 0.00	I= 1.47	I= .65	I= 0.00		P	12 42.86	.91
E S T P	E S F P	E N F P	E N T P	P E R C E P T I V E S	IJ	9 32.14	1.26
N= 0	N= 6	N= 1	N= 0		IP	7 25.00	1.15
%= 0.00	%=21.43	%= 3.57	%= 0.00		EP	5 17.86	.70
I= 0.00	I= 1.47	I= .65	I= 0.00		EJ	7 25.00	.92
E S T J	E S F J	E N F J	E N T J	E X T R A V E R T S	ST	9 32.14	1.04
N= 3	N= 1	N= 1	N= 0		SF	13 46.43	.95
%=10.71	%= 3.57	%= 3.57	%= 0.00		NF	3 10.71	.74
I= .98	I= .49	I= .49	I= 0.00		NT	3 10.71	1.96
E S T P	E S F P	E N F P	E N T P	J U D G I N G	SJ	12 42.86	.94
N= 3	N= 1	N= 1	N= 0		SP	10 35.71	1.03
%=10.71	%= 3.57	%= 3.57	%= 0.00		NP	2 7.14	.56
I= .98	I= .49	I= .49	I= 0.00		NJ	4 14.29	1.96
E S T J	E S F J	E N F J	E N T J	J U D G I N G	TJ	9 32.14	1.36
N= 2	N= 3	N= 1	N= 1		TP	3 10.71	.84
%= 7.14	%=10.71	%= 3.57	%= 3.57		FP	9 32.14	.93
I= .98	I= .65	I= 1.96	I= 1.96		FJ	7 25.00	.86
					IN	3 10.71	1.18
					EN	3 10.71	.98
					IS	13 46.43	1.22
					ES	9 32.14	.77

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

* IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

* IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERSCORE) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.

I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-8

SRTT Analysis: Above the Median on the Pain Rating Index Affective (PRIA) of the McGill Pain Questionnaire

N= 27

SENSING TYPES		INTUITIVE TYPES			N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING				
I S T J	I S F J	I N F J	I N T J	J U D G I N G I N T R O V E R T S	E	17 62.96	1.19
N= 2	N= 3	N= 0	N= 0		I	10 37.04	.78
%= 7.41	%=11.11	%= 0.00	%= 0.00		S	22 81.48	1.02
I= .68	I= 1.02	I= 0.00	I= 0.00		N	5 18.52	.93
I S T P	I S F P	I N F P	I N T P	P E R C E P T I V E S	T	8 29.63	.81
N= 1	N= 2	N= 2	N= 0		F	19 70.37	1.11
%= 3.70	%= 7.41	%= 7.41	%= 0.00		J	13 48.15	.91
I= 2.04	I= .51	I= 1.36	I= 0.00		P	14 51.85	1.10
E S T P	E S F P	E N F P	E N T P	E X T R A V E R T S	IJ	5 18.52	.73
N= 3	N= 3	N= 3	N= 0		IP	5 18.52	.85
%=11.11	%=11.11	%=11.11	%= 0.00		EP	9 33.33	1.31
I= 1.02	I= 1.53	I= 1.53	I= 0.00		EJ	8 29.63	1.09
E S T J	E S F J	E N F J	E N T J	J U D G I N G I N T R O V E R T S	ST	8 29.63	.96
N= 2	N= 6	N= 0	N= 0		SF	14 51.85	1.06
%= 7.41	%=22.22	%= 0.00	%= 0.00		NE	5 18.52	1.27
I= 1.02	I= 1.36	I= 0.00	I= 0.00		NT	0 0.00	0.00
				A V E R T S	SJ	13 48.15	1.06
					SP	9 33.33	.96
					NP	5 18.52	1.46
					NJ	0 0.00	0.00
				J U D G I N G I N T R O V E R T S	TJ	4 14.81	.63
					TP	4 14.81	1.16
					FP	10 37.04	1.07
					FJ	9 33.33	1.15
				A V E R T S	IN	2 7.41	.81
					EN	3 11.11	1.02
					IS	8 29.63	.78
					ES	14 51.85	1.24

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

" IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERSCORE) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-9

SRTT Analysis: Below the Median on the Number of Words Chosen
 Evaluative (NWCE) Scale of the McGill Pain Questionnaire

N= 8

SENSING TYPES WITH THINKING		WITH FEELING		INTUITIVE TYPES WITH FEELING		WITH THINKING		J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	N	%	I
I S T J	I S F J	I N F J	I N T J												
N= 2	N= 1	N= 0	N= 0	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	E	5	62.50	1.19
%=25.00	%=12.50	%= 0.00	%= 0.00									I	3	37.50	.79
I= 2.29	I= 1.15	I= 0.00	I= 0.00									S	8	*****	1.25
												N	0	0.00	0.00
I S T P	I S F P	I N F P	I N T P	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	T	4	50.00	1.38
N= 0	N= 0	N= 0	N= 0									F	4	50.00	.79
%= 0.00	%= 0.00	%= 0.00	%= 0.00									J	6	75.00	1.42
I= 0.00	I= 0.00	I= 0.00	I= 0.00									P	2	25.00	.53
E S T P	E S F P	E N F P	E N T P	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	IJ	3	37.50	1.47
N= 0	N= 0	N= 0	N= 0									IP	0	0.00	0.00
%= 0.00	%= 0.00	%= 0.00	%= 0.00									EP	2	25.00	.98
I= 0.00	I= 0.00	I= 0.00	I= 0.00									EJ	3	37.50	1.38
E S T J	E S F J	E N F J	E N T J	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	ST	4	50.00	1.62
N= 2	N= 0	N= 0	N= 0									SF	4	50.00	1.02
%=25.00	%= 0.00	%= 0.00	%= 0.00									NF	0	0.00	0.00
I= 2.29	I= 0.00	I= 0.00	I= 0.00									NT	0	0.00	0.00
E S T P	E S F P	E N F P	E N T P	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	SJ	6	75.00	1.65
N= 0	N= 0	N= 0	N= 0									SP	2	25.00	.72
%= 0.00	%= 0.00	%= 0.00	%= 0.00									NF	0	0.00	0.00
I= 2.29	I= 0.00	I= 0.00	I= 0.00									NJ	0	0.00	0.00
E S T J	E S F J	E N F J	E N T J	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	TJ	2	25.00	1.06
N= 0	N= 3	N= 0	N= 0									TP	2	25.00	1.96
%= 0.00	%=37.50	%= 0.00	%= 0.00									FP	0	0.00	0.00
I= 0.00	I= 2.29	I= 0.00	I= 0.00									FJ	4	50.00	1.72
				J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	IN	0	0.00	0.00
												EN	0	0.00	0.00
												IS	3	37.50	.98
												ES	5	62.50	1.49

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

" IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

* IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERSCORE) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
 I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-11

SRTT Analysis: Below the Median on the Pain Rating Index Evaluative (PRIE) Scale of the McGill Pain Questionnaire

N= 27

SENSING TYPES		INTUITIVE TYPES			N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING				
I S T J	I S F J	I N F J	I N T J	JUDGMENT IN T R O V E R T S	E	15 55.56	1.05
N= 4	N= 3	N= 0	N= 1		I	12 44.44	.94
%=14.81	%=11.11	%= 0.00	%= 3.70		S	22 81.48	1.02
I= 1.36	I= 1.02	I= 0.00	I= 1.02		N	5 18.52	.93
I S T P	I S F P	I N F P	I N T P	P E R C E P T I V E S	T	11 40.74	1.12
N= 0	N= 3	N= 1	N= 0		F	16 59.26	.93
%= 0.00	%=11.11	%= 3.70	%= 0.00		J	15 55.56	1.05
I= 0.00	I= .76	I= .68	I= 0.00		P	12 44.44	.94
E S T P	E S F P	E N F P	E N T P	E X T R A V E R S I V E S	IJ	8 29.63	1.16
N= 4	N= 2	N= 2	N= 0		IP	4 14.81	.68
%=14.81	%= 7.41	%= 7.41	%= 0.00		EP	8 29.63	1.16
I= 1.36	I= 1.02	I= 1.02	I= 0.00		EJ	7 25.93	.95
E S T J	E S F J	E N F J	E N T J	J U D G I N G	ST	9 33.33	1.08
N= 1	N= 5	N= 0	N= 1		SF	13 48.15	.98
%= 3.70	%=18.52	%= 0.00	%= 3.70		NF	3 11.11	.76
I= .51	I= 1.13	I= 0.00	I= 2.04		NT	2 7.41	1.36
					SJ	13 48.15	1.06
					SP	9 33.33	.96
					NF	3 11.11	.87
					NJ	2 7.41	1.02
					TJ	7 25.93	1.10
					TP	4 14.81	1.16
					FP	8 29.63	.86
					FJ	8 29.63	1.02
					IN	2 7.41	.81
					EN	3 11.11	1.02
					IS	10 37.04	.97
					ES	12 44.44	1.06

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

" IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

* IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERSCORE) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-12

SRTT Analysis: Above the Median on the Pain Rating Index Evaluative (PRIE) Scale of the McGill Pain Questionnaire

N= 28

SENSING TYPES		INTUITIVE TYPES				N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING					
I S T J	I S F J	I N F J	I N T J	J U D G I N G	I N T R O V E R T S	E	14 50.00	.95
N= 2	N= 3	N= 0	N= 1			I	14 50.00	1.06
%= 7.14	%=10.71	%= 0.00	%= 3.57			S	22 78.57	.98
I= .65	I= .98	I= 0.00	I= .98			N	6 21.43	1.07
I S T P	I S F P	I N F P	I N T P	P E R C E P T I V E S	E X T R A V E R T S	T	9 32.14	.83
N= 1	N= 5	N= 2	N= 0			F	19 67.86	1.07
%= 3.57	%=17.86	%= 7.14	%= 0.00			J	14 50.00	.95
I= 1.96	I= 1.23	I= 1.31	I= 0.00			P	14 50.00	1.06
E S T P	E S F P	E N F P	E N T P	J U D G I N G	I N T R O V E R T S	IJ	6 21.43	.84
N= 2	N= 2	N= 2	N= 0			IP	8 28.57	1.31
%= 7.14	%= 7.14	%= 7.14	%= 0.00			EP	6 21.43	.84
I= .65	I= .98	I= .98	I= 0.00			EJ	8 28.57	1.05
E S T J	E S F J	E N F J	E N T J	J U D G I N G	E X T R A V E R T S	ST	8 28.57	.92
N= 3	N= 4	N= 1	N= 0			SF	14 50.00	1.02
%=10.71	%=14.29	%= 3.57	%= 0.00			NF	5 17.86	1.23
I= 1.47	I= .87	I= 1.96	I= 0.00			NT	1 3.57	.65
						SJ	12 42.86	.94
						SP	10 35.71	1.03
						NF	4 14.29	1.12
						NJ	2 7.14	.98
						TJ	6 21.43	.91
						TP	3 10.71	.84
						FP	11 39.29	1.14
						FJ	8 28.57	.98
						IN	3 10.71	1.18
						EN	3 10.71	.98
						IS	11 39.29	1.03
						ES	11 39.29	.94

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

" IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

* IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERSCORE) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.

I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-13

SRTT Analysis: Below the Median on the Pain Rating Index Total
(PRIT) of the McGill Pain Questionnaire

N= 29

SENSING TYPES		INTUITIVE TYPES			N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING				
I S T J	I S F J	I N F J	I N T J	J U D G I N G	E	13 44.83	.85
					I	16 55.17	1.17
N= 4	N= 2	N= 0	N= 2		S	23 79.31	.99
%=13.79	%= 6.90	%= 0.00	%= 6.90		N	6 20.69	1.03
I= 1.26	I= .63	I= 0.00	I= 1.90	I N T R O V E R T S	T	10 34.48	.95
					F	19 65.52	1.03
					J	15 51.72	.98
					P	14 48.28	1.02
I S T P	I S F P	I N F P	I N T P	P E R C E P T I V E S	I J	8 27.59	1.08
					I P	8 27.59	1.26
N= 0	N= 7	N= 1	N= 0		E P	6 20.69	.81
%= 0.00	%=24.14	%= 3.45	%= 0.00		E J	7 24.14	.89
I= 0.00	I= 1.66	I= .63	I= 0.00		S T	7 24.14	.78
					S F	16 55.17	1.12
E S T P	E S F P	E N F P	E N T P	E X T R A V E R T S	N F	3 10.34	.71
					N T	3 10.34	1.90
N= 2	N= 3	N= 1	N= 0		S J	11 37.93	.83
%= 6.90	%=10.34	%= 3.45	%= 0.00		S P	12 41.38	1.20
I= .63	I= 1.42	I= .47	I= 0.00		N P	2 6.90	.54
					N J	4 13.79	1.90
E S T J	E S F J	E N F J	E N T J	J U D G I N G	T J	8 27.59	1.17
					T P	2 6.90	.54
N= 1	N= 4	N= 1	N= 1		F P	12 41.38	1.20
%= 3.45	%=13.79	%= 3.45	%= 3.45		F J	7 24.14	.83
I= .47	I= .84	I= 1.90	I= 1.90		I N	3 10.34	1.14
					E N	3 10.34	.95
					I S	13 44.83	1.17
					E S	10 34.48	.82

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

" IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

* IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERSCORE) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-14

SRTT Analysis: Above the Median on the Pain Rating Index Total
(PRIT) Scale of the McGill Pain Questionnaire

N= 26

SENSING TYPES WITH THINKING		INTUITIVE TYPES WITH FEELING			N	%	I
I S T J	I S F J	I N F J	I N T J				
N= 2	N= 4	N= 0	N= 0	J U D G I N G I N T R O V E R T S P E R C E P T I V E S E X T R A V E R T S J U D G I N G	E	16 61.54	1.17
%= 7.69	%=15.38	%= 0.00	%= 0.00		I	10 38.46	.81
I= .71	I= 1.41	I= 0.00	I= 0.00		S	21 80.77	1.01
					N	5 19.23	.96
					T	10 38.46	1.06
					F	16 61.54	.97
					J	14 53.85	1.02
					P	12 46.15	.98
					IJ	6 23.08	.91
					IP	4 15.38	.71
					EP	8 30.77	1.21
					EJ	8 30.77	1.13
					ST	10 38.46	1.24
					SF	11 42.31	.86
					NF	5 19.23	1.32
					NT	0 0.00	0.00
					SJ	14 53.85	1.18
					SP	7 26.92	.78
					NP	5 19.23	1.51
					NJ	0 0.00	0.00
					TJ	5 19.23	.81
					TP	5 19.23	1.51
					FP	7 26.92	.78
					FJ	9 34.62	1.19
					IN	2 7.69	.85
					EN	3 11.54	1.06
					IS	8 30.77	.81
					ES	13 50.00	1.20

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

- " IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;
 - * IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;
 - * IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.
- (UNDERSCORE) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-15

SRTT Analysis: Below the Median on the Number of Words Chosen Total (NWCT) Scale of the McGill Pain Questionnaire

N= 25

SENSING TYPES		INTUITIVE TYPES				N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING					
I S T J	I S F J	I N F J	I N T J	JUDGING	E	11	44.00	.83
N= 4	N= 2	N= 0	N= 2		I	14	56.00	1.18
%=16.00	%= 8.00	%= 0.00	%= 8.00		S	19	76.00	.95
I= 1.47	I= .73	I= 0.00	I= 2.20		N	6	24.00	1.20
I S T P	I S F P	I N F P	I N T P	INTROVERTS	T	10	40.00	1.10
N= 0	N= 5	N= 1	N= 0		F	15	60.00	.94
%= 0.00	%=20.00	%= 4.00	%= 0.00		J	14	56.00	1.06
I= 0.00	I= 1.37	I= .73	I= 0.00		P	11	44.00	.93
E S T P	E S F P	E N F P	E N T P	PERCEPTIVES	IJ	8	32.00	1.26
N= 0	N= 5	N= 1	N= 0		IP	6	24.00	1.10
%= 0.00	%=20.00	%= 4.00	%= 0.00		EP	5	20.00	.79
I= 0.00	I= 1.37	I= .73	I= 0.00		EJ	6	24.00	.88
E S T J	E S F J	E N F J	E N T J	EXTRAVERTS	ST	7	28.00	.91
N= 2	N= 2	N= 1	N= 0		SF	12	48.00	.98
%= 8.00	%= 8.00	%= 4.00	%= 0.00		NF	3	12.00	.82
I= .73	I= 1.10	I= .55	I= 0.00		NT	3	12.00	2.20
I S T J	I S F J	I N F J	I N T J	JUDGING	SJ	10	40.00	.88
N= 1	N= 3	N= 1	N= 1		SP	9	36.00	1.04
%= 4.00	%=12.00	%= 4.00	%= 4.00		NP	2	8.00	.63
I= .55	I= .73	I= 2.20	I= 2.20		NJ	4	16.00	2.20
E S T P	E S F P	E N F P	E N T P	INTROVERTS	TJ	8	32.00	1.35
N= 0	N= 5	N= 1	N= 0		TP	2	8.00	.63
%= 0.00	%=20.00	%= 4.00	%= 0.00		FP	9	36.00	1.04
I= 0.00	I= 1.37	I= .73	I= 0.00		FJ	6	24.00	.82
E S T J	E S F J	E N F J	E N T J	JUDGING	IN	3	12.00	1.32
N= 1	N= 3	N= 1	N= 1		EN	3	12.00	1.10
%= 4.00	%=12.00	%= 4.00	%= 4.00		IS	11	44.00	1.15
I= .55	I= .73	I= 2.20	I= 2.20		ES	8	32.00	.77

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

" IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

* IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERScore) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-16

SRTT Analysis: Above the Median on the Number of Words Chosen Total (NWCT) Scale of the McGill Pain Questionnaire

N= 30

SENSING TYPES				INTUITIVE TYPES				J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	N	%	I	
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING	WITH FEELING	WITH THINKING	WITH FEELING	WITH THINKING									
I S T J	I S F J	I N F J	I N T J	I S T P	I S F P	I N F P	I N T P	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	E	18	60.00	1.14
N= 2	N= 4	N= 0	N= 0										I	12	40.00	.85
%= 6.67	%=13.33	%= 0.00	%= 0.00										S	25	83.33	1.04
I= .61	I= 1.22	I= 0.00	I= 0.00										N	5	16.67	.83
I S T J	I S F J	I N F J	I N T J	I S T P	I S F P	I N F P	I N T P	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	T	10	33.33	.92
													F	20	66.67	1.05
													J	15	50.00	.95
													P	15	50.00	1.06
I S T J	I S F J	I N F J	I N T J	I S T P	I S F P	I N F P	I N T P	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	IJ	6	20.00	.79
N= 1	N= 3	N= 2	N= 0										IP	6	20.00	.92
%= 3.33	%=10.00	%= 6.67	%= 0.00										EP	9	30.00	1.18
I= 1.83	I= .69	I= 1.22	I= 0.00										EJ	9	30.00	1.10
E S T P	E S F P	E N F P	E N T P	E S T J	E S F J	E N F J	E N T J	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	ST	10	33.33	1.08
													SF	15	50.00	1.02
													NF	5	16.67	1.15
													NT	0	0.00	0.00
E S T P	E S F P	E N F P	E N T P	E S T J	E S F J	E N F J	E N T J	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	SJ	15	50.00	1.10
N= 4	N= 2	N= 3	N= 0										SP	10	33.33	.96
%=13.33	%= 6.67	%=10.00	%= 0.00										NP	5	16.67	1.31
I= 1.22	I= .92	I= 1.37	I= 0.00										NJ	0	0.00	0.00
E S T P	E S F P	E N F P	E N T P	E S T J	E S F J	E N F J	E N T J	J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	TJ	5	16.67	.71
													TP	5	16.67	1.31
													FP	10	33.33	.96
													FJ	10	33.33	1.15
N= 3	N= 6	N= 0	N= 0					J U D G I N G	I N T R O V E R T S	P E R C E P T I V E S	E X T R A V E R T S	J U D G I N G	IN	2	6.67	.73
%=10.00	%=20.00	%= 0.00	%= 0.00										EN	3	10.00	.92
I= 1.37	I= 1.22	I= 0.00	I= 0.00										IS	10	33.33	.87
													ES	15	50.00	1.20

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

* IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERScore) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-17

SRTT Analysis: Below the Median on Number of Symptoms

N= 28

SENSING TYPES		INTUITIVE TYPES				N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING					
I S T J	I S F J	I N F J	I N T J	J U D G I N G I N T R O V E R T S P E R C E P T I V E S E X T R A V E R T S J U D G I N G	E	13	46.43	.88
					I	15	53.57	1.13
N= 5	N= 1	N= 0	N= 1		S	24	85.71	1.07
%=17.86	%= 3.57	%= 0.00	%= 3.57		N	4	14.29	.71
I= 1.64	I= .33	I= 0.00	I= .98		T	11	39.29	1.08
					F	17	60.71	.95
					J	16	57.14	1.08
					P	12	42.86	.91
					IJ	7	25.00	.98
					IP	8	28.57	1.31
					EP	4	14.29	.56
					EJ	9	32.14	1.13
					ST	9	32.14	1.04
					SF	15	53.57	1.09
					NF	2	7.14	.49
					NT	2	7.14	1.31
					SJ	14	50.00	1.10
					SP	10	35.71	1.03
					NP	2	7.14	.56
					NJ	2	7.14	.98
					TJ	10	35.71	1.51
					TP	1	3.57	.28
					FP	11	39.29	1.14
					FJ	6	21.43	.74
					IN	3	10.71	1.13
					EN	1	3.57	.33
					IS	12	42.86	1.12
					ES	12	42.86	1.02

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

" IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERScore) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-18

SRTT Analysis: Above the Median on Number of Symptoms

N= 27

SENSING TYPES		INTUITIVE TYPES			N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING				
I S T J	I S F J	I N F J	I N T J	J U D G I N G I N T R O V E R T S P E R C E P T I V E S E X T R A V E R T S J U D G I N G	E	16 59.26	1.12
					I	11 40.74	.86
N= 1	N= 5	N= 0	N= 1		S	20 74.07	.93
%= 3.70	%=18.52	%= 0.00	%= 3.70		N	7 25.93	1.30
I= .34	I= 1.70	I= 0.00	I= 1.02		T	9 33.33	.92
					F	18 66.67	1.05
					J	13 48.15	.91
					P	14 51.85	1.10
I S T P	I S F P	I N F P	I N T P		IJ	7 25.93	1.02
					IP	4 14.81	.68
N= 1	N= 2	N= 1	N= 0		EP	10 37.04	1.46
%= 3.70	%= 7.41	%= 3.70	%= 0.00		EJ	6 22.22	.81
I= 2.04	I= .51	I= .68	I= 0.00		ST	8 29.63	.96
					SF	12 44.44	.91
E S T P	E S F P	E N F P	E N T P		NF	6 22.22	1.53
					NT	1 3.70	.68
N= 5	N= 1	N= 4	N= 0		SJ	11 40.74	.90
%=18.52	%= 3.70	%=14.81	%= 0.00		SP	9 33.33	.96
I= 1.70	I= .51	I= 2.04	I= 0.00		NP	5 18.52	1.46
					NJ	2 7.41	1.02
E S T J	E S F J	E N F J	E N T J		TJ	3 11.11	.47
					TP	6 22.22	1.75
N= 1	N= 4	N= 1	N= 0		FP	8 29.63	.86
%= 3.70	%=14.81	%= 3.70	%= 0.00		FJ	10 37.04	1.27
I= .51	I= .91	I= 2.04	I= 0.00		IN	2 7.41	.81
					EN	5 18.52	1.70
					IS	9 33.33	.87
					ES	11 40.74	.97

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

* IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

* IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERScore) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.
I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-19

SRTT Analysis: Below the Median on Health Locus of Control

N= 24

SENSING TYPES WITH THINKING		INTUITIVE TYPES WITH FEELING				N	%	I
ISTJ	ISFJ	INFJ	INTJ					
N= 1	N= 4	N= 0	N= 1	JUDGING INTROVERTS	E	12	50.00	.95
%= 4.17	%= 16.67	%= 0.00	%= 4.17		I	12	50.00	1.05
I= .38	I= 1.53	I= 0.00	I= 1.15		S	17	70.83	.89
					N	7	29.17	1.46
				PERCEPTIVES EXTRAVERTS	T	6	25.00	.69
					F	18	75.00	1.18
					J	12	50.00	.95
					P	12	50.00	1.06
ISTP	ISFP	INFP	INTP	JUDGING INTROVERTS	IJ	6	25.00	.98
N= 0	N= 3	N= 3	N= 0		IP	6	25.00	1.15
%= 0.00	%= 12.50	%= 12.50	%= 0.00		EP	6	25.00	.98
I= 0.00	I= .86	I= 2.29	I= 0.00		EJ	6	25.00	.92
ESTP	ESFP	ENFP	ENTP	PERCEPTIVES EXTRAVERTS	ST	5	20.83	.67
N= 2	N= 1	N= 3	N= 0		SF	12	50.00	1.02
%= 8.33	%= 4.17	%= 12.50	%= 0.00		NF	6	25.00	1.72
I= .76	I= .57	I= 1.72	I= 0.00		NT	1	4.17	.76
ESTJ	ESFJ	ENFJ	ENTJ	JUDGING INTROVERTS	SJ	11	45.83	1.01
N= 2	N= 4	N= 0	N= 0		SP	6	25.00	.72
%= 8.33	%= 16.67	%= 0.00	%= 0.00		NP	6	25.00	1.96"
I= 1.15	I= 1.02	I= 0.00	I= 0.00		NJ	1	4.17	.57
				JUDGING INTROVERTS	TJ	4	16.67	.71
					TP	2	8.33	.65
					FP	10	41.67	1.21
					FJ	8	33.33	1.15
				PERCEPTIVES EXTRAVERTS	IN	4	16.67	1.83
					EN	3	12.50	1.15
					IS	8	33.33	.87
					ES	9	37.50	.90

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

" IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

(UNDERSCORE) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.

I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

Table E-20

SRTT Analysis: Above the Median on Health Locus of Control

N= 31

SENSING TYPES		INTUITIVE TYPES				N	%	I
WITH THINKING	WITH FEELING	WITH FEELING	WITH THINKING					
I S T J	I S F J	I N F J	I N T J	J U D G I N G	I N T R O V E R T S	E	17 54.84	1.04
						I	14 45.16	.96
N= 5	N= 2	N= 0	N= 1			S	27 87.10	1.09
%=16.13	%= 6.45	%= 0.00	%= 3.23			N	4 12.90	.65
I= 1.48	I= .59	I= 0.00	I= .89	P E R C E P T I V E S	E X T R A V E R T S	T	14 45.16	1.24
						F	17 54.84	.86
						J	17 54.84	1.04
						P	14 45.16	.96
I S T P	I S F P	I N F P	I N T P	P E R C E P T I V E S	E X T R A V E R T S	IJ	8 25.81	1.01
						IP	6 19.35	.89
N= 1	N= 5	N= 0	N= 0			EP	8 25.81	1.01
%= 3.23	%=16.13	%= 0.00	%= 0.00			EJ	9 29.03	1.06
I= 1.77	I= 1.11	I= 0.00	I= 0.00	J U D G I N G	I N T R O V E R T S	ST	12 38.71	1.25
						SF	15 48.39	.99
						NF	2 6.45	.44
						NT	2 6.45	1.18
E S T P	E S F P	E N F P	E N T P	J U D G I N G	I N T R O V E R T S	SJ	14 45.16	.99
						SP	13 41.94	1.21
N= 4	N= 3	N= 1	N= 0			NP	1 3.23	.25"
%=12.90	%= 9.68	%= 3.23	%= 0.00			NJ	3 9.68	1.33
I= 1.18	I= 1.33	I= .44	I= 0.00	J U D G I N G	I N T R O V E R T S	TJ	9 29.03	1.23
						TP	5 16.13	1.27
						FP	9 29.03	.84
						FJ	8 25.81	.89
E S T J	E S F J	E N F J	E N T J	J U D G I N G	I N T R O V E R T S	IN	1 3.23	.35
						EN	3 9.68	.89
N= 2	N= 5	N= 1	N= 1			IS	13 41.94	1.10
%= 6.45	%=16.13	%= 3.23	%= 3.23			ES	14 45.16	1.08
I= .89	I= .99	I= 1.77	I= 1.77					

NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:

" IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. > 3.8;

* IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. > 6.6;

* IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

- (UNDERScore) INDICATES FISHER'S EXACT PROBABILITY USED INSTEAD OF CHI-SQUARE.

BASE POPULATION USED IN CALCULATING SELECTION RATIO:

Total population in Schoeffel study

BASE TOTAL N = 55. SAMPLE AND BASE ARE DEPENDENT.

LEGEND: % = PERCENT OF TOTAL CHOOSING THIS GROUP WHO FALL INTO THIS TYPE.

I = SELFSELECTION INDEX; RATIO OF PERCENT OF TYPE IN GROUP TO % IN SAMPLE.

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BIOGRAPHICAL SKETCH

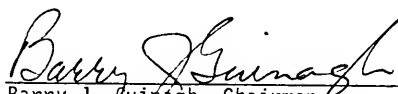
Joan Alice Heenan was born in New York, the eldest of three children of a surgeon father and a nurse mother who wrote for the Saturday Evening Post for many years. She was graduated from Elizabeth Seton School in 1954 and the Lenox Hill Hospital School of Nursing in 1957. In 1958 she married Alfred Canal, an accountant with Arthur Young and Company and then with Bristol Myers until his death in 1967. With their three children, she then spent two years at the familial home in Bogota, Columbia, prior to moving to Gainesville, Florida, in 1972. During nine of these years she worked in pediatrics, public health, psychiatry, and surgery in clinical nursing and instructorships.

She received the Bachelor of Health Science with high honors in 1978 and the Master of Education in 1979 from the University of Florida, Gainesville. During her doctoral studies in the foundations of education program, she developed special interests in personality and learning and became project director of the Nutrition Education and Training program (NET) for the Institute of Food and Agricultural Sciences, University of Florida. She was responsible for preparation of proposals and the development and evaluation of nutrition education materials for teachers and students in preschool settings. On completion of this program, she received an appointment as program evaluator and grant writer for the Technical Assistance Health Resource Group (TAHRG), University of Florida, with responsibility for the

development and analysis of evaluation protocols for preventative health education in rural high schools of Florida. Since the completion of that project she has taught classes on educational methods for the University of Florida and nursing fundamentals for Santa Fe Community College. In July 1983 she married Michael Schoeffel, a widowed anesthesiologist with four children.

On the completion of the Ph.D. program, she intends to continue work in the area of health psychology, with research and consultation and grant writing for a private group, the Biophysical Research Foundation. Her two years of work in the study of pain and personality have left her with a strong interest in preventive medicine and the influence of health attitudes on wellness. In the best tradition of Jungian archetypes, she wishes to continue her mother's writing career, developing feminist literature based on her experiences.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



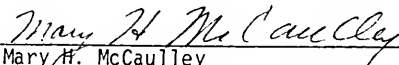
Barry J. Guinagh, Chairman
Associate Professor of Foundations of
Education

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Robert S. Soar, Cochairman
Professor of Foundations of Education

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Mary H. McCaulley
Assistant Professor of Clinical
Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Margaret K. Morgan
Margaret K. Morgan
Professor of Educational Leadership

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December 1986

James A. Alguire
Chairman, Foundations of Education

David C. Smith (N)
Dean, College of Education

Dean, Graduate School

UNIVERSITY OF FLORIDA



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